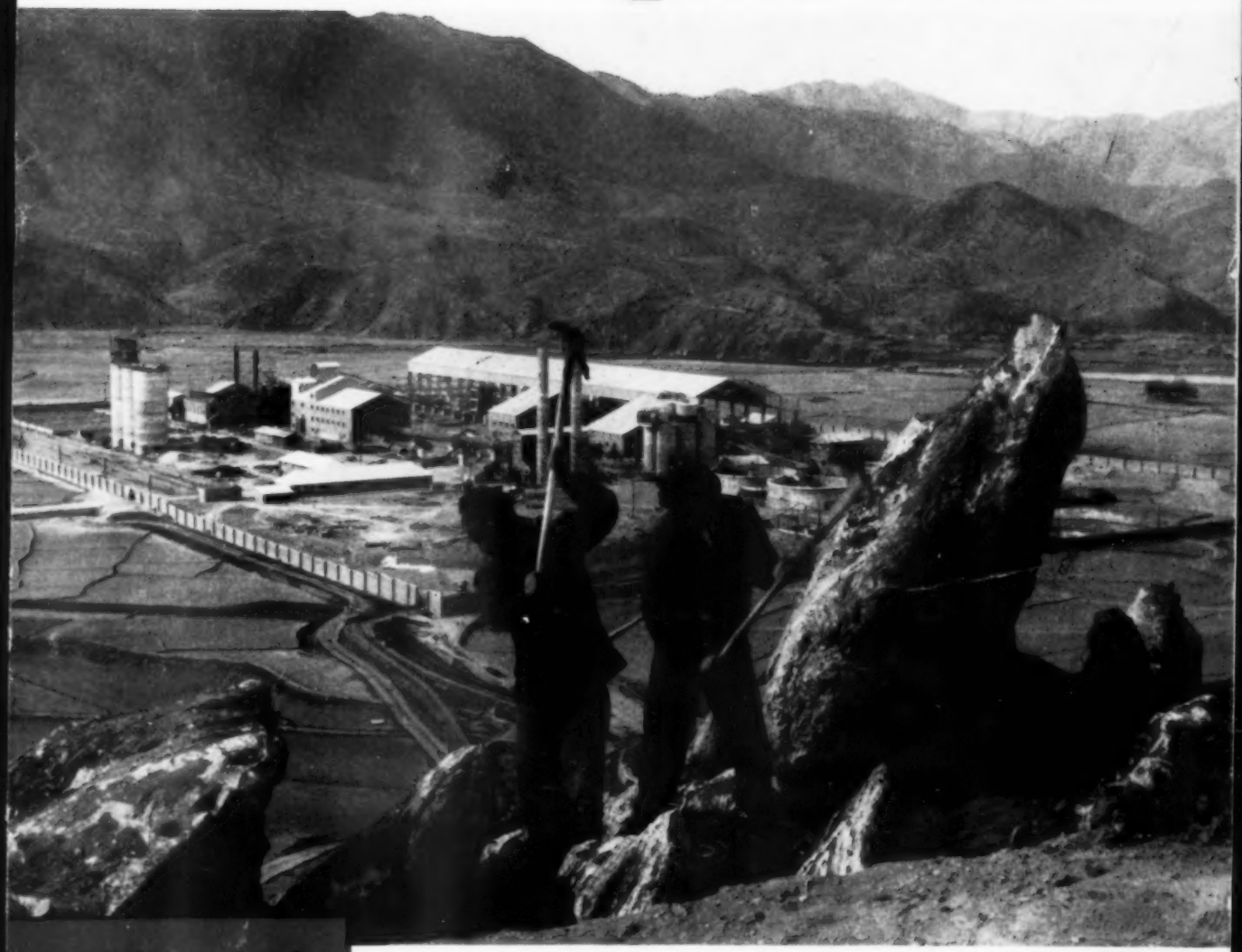
For producers of Sand and Gravel, Crushed Stone, Cement, Lime, Gypsum, and other nonmetallic minerals

NOVEMBER 1957

PIT and QUARRY



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Tradition and Modernity at South Korea's Newest Cement Mill. (See Page 74.)

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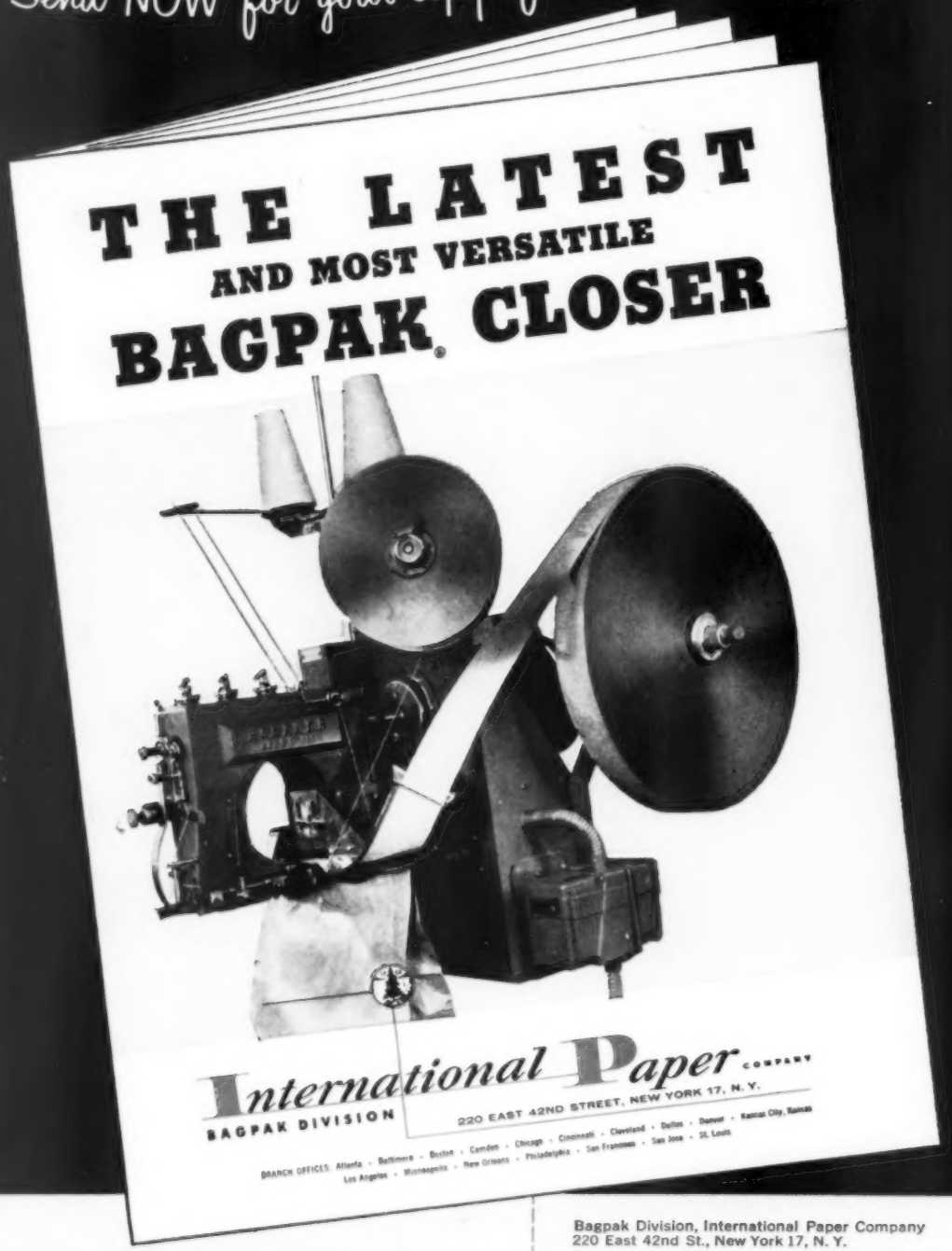
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pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

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Cover Picture

• Against a backdrop of modern construction, two pick-swinging Korean laborers provide an intriguing contrast in the cover picture of this issue. In an area where a few years ago opposing soldiers were digging for cover, these men are removing cover—as a peaceful pursuit, and as a symbol of international co-operation. The workers are removing overburden from a limestone deposit that furnishes raw material to the new 200,000-ton per year cement plant in the valley below. The plant is being built with funds provided by the United Nations Korean Reconstruction Agency. (See page 74.)

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals.

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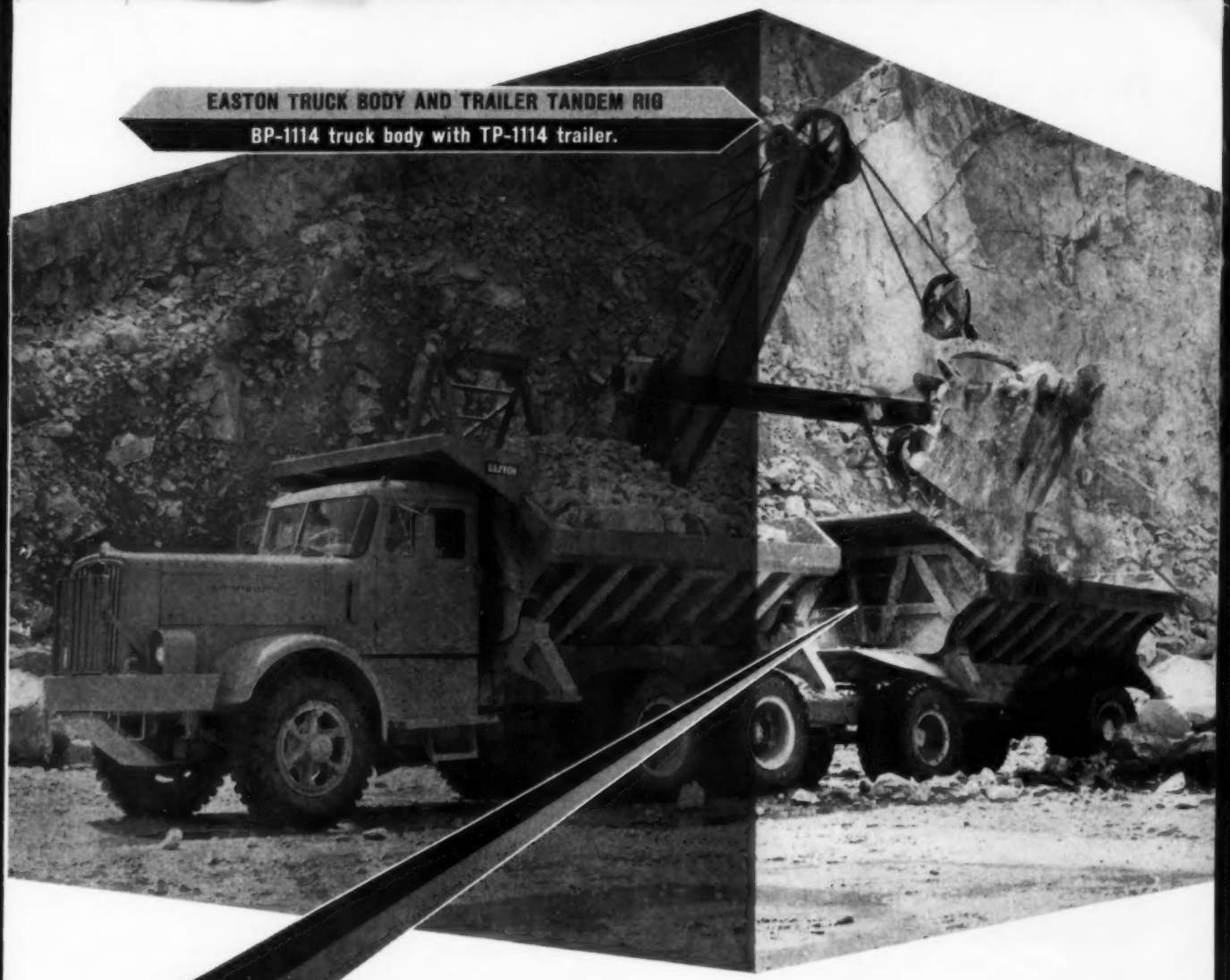
To subscribers: When requesting change of address, kindly send old as well as new address.

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX



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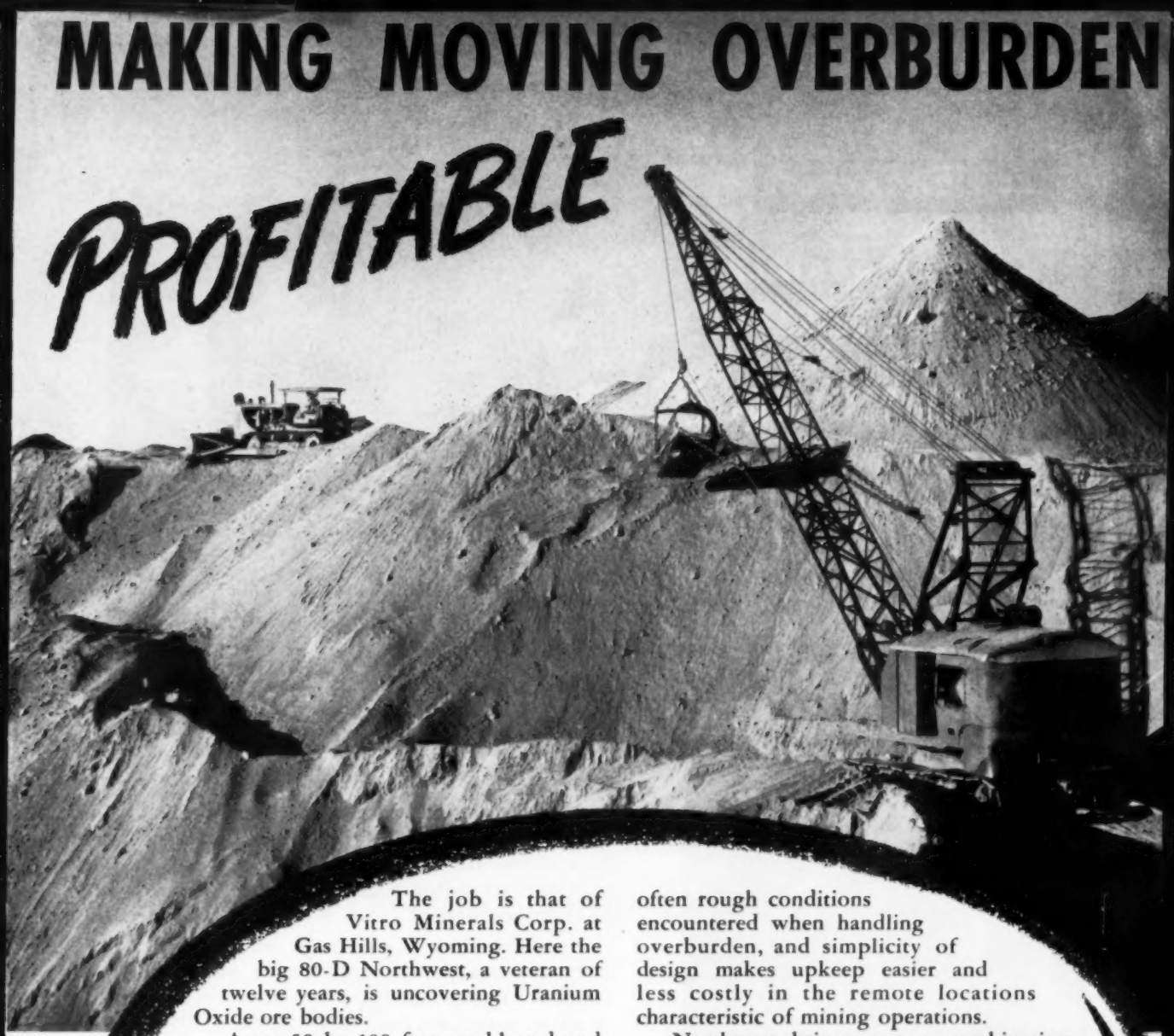

The job is that of Vitro Minerals Corp. at Gas Hills, Wyoming. Here the big 80-D Northwest, a veteran of twelve years, is uncovering Uranium Oxide ore bodies.

Areas 50 by 100 feet are blasted and uncovered. The amount of overburden removed is enormous, but it has been found that 20 feet of overburden can be profitably removed for every foot of ore.

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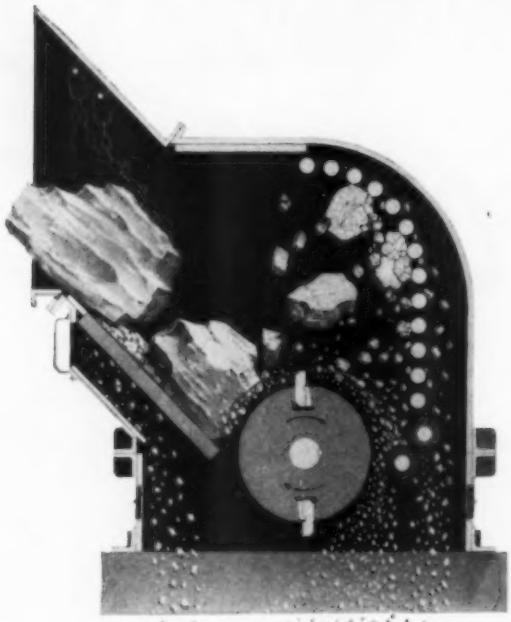
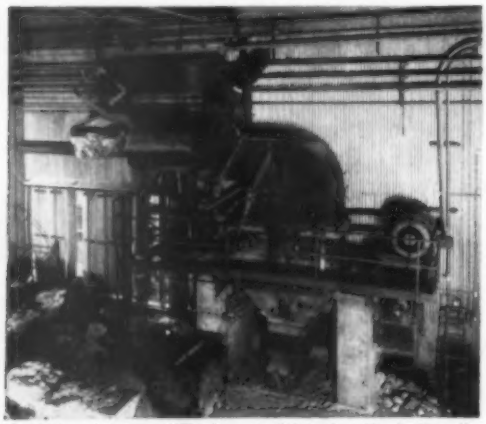


THE JEFFREY ROCK BUSTER

24-inch carbon electrodes, 6 feet long, have been fed to this Rock Buster for seven years. Plant engineers are "amazed" at its continued fine performance.



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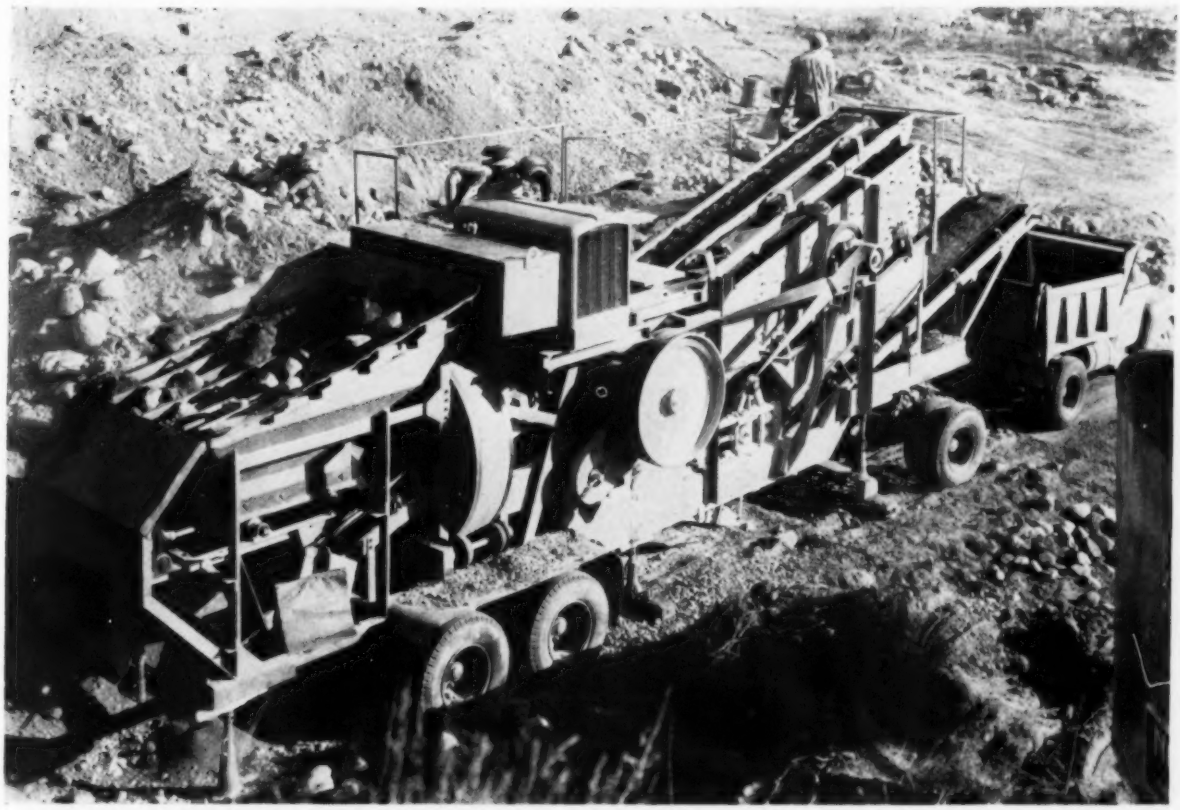

Pit-run material being shovel loaded into hopper of Diamond 66 plant. Hopper is equipped with grizzly for scalping and plate feeder for regulating flow to plant conveyor. D-449

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- **high speed roll crusher steps up output by eliminating reruns through jaw crusher, has high capacity for its weight, requires low h.p. per ton produced.**
- **balanced vibrating screen does thorough job of separating materials without clogging, can be depended upon for long, trouble-free service.**
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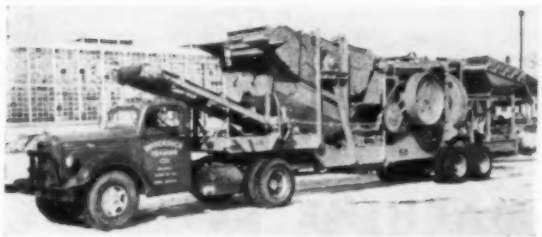

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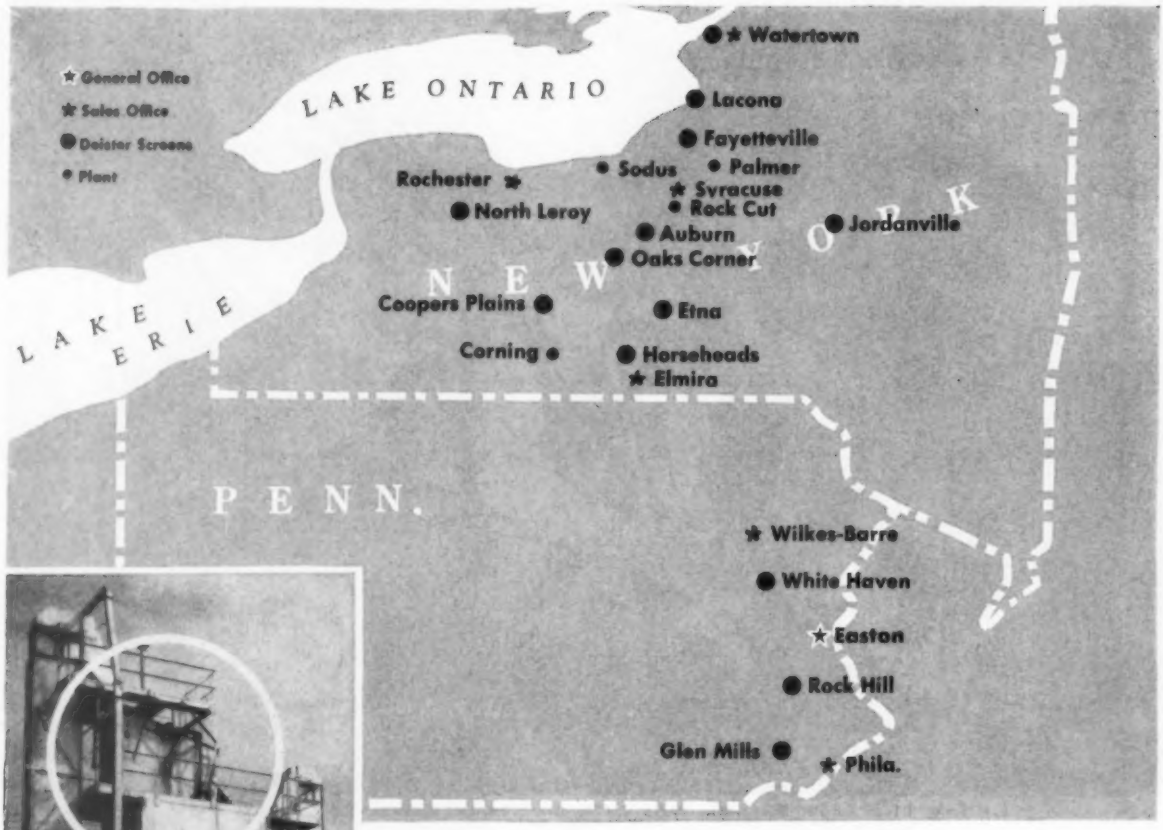
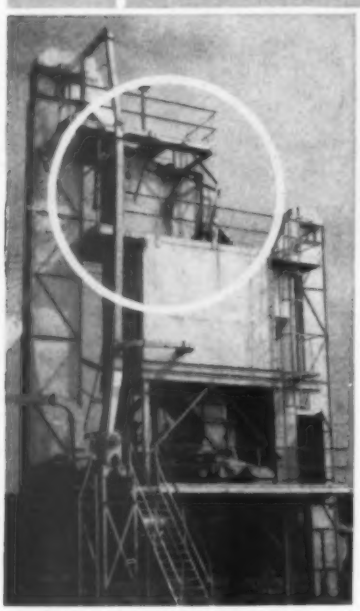
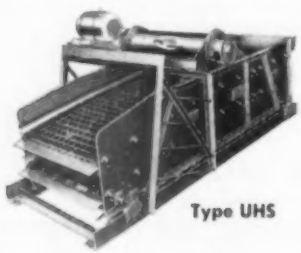




A typical Deister screen installation on an asphalt plant of General Crushed Stone, Watertown, N. Y.



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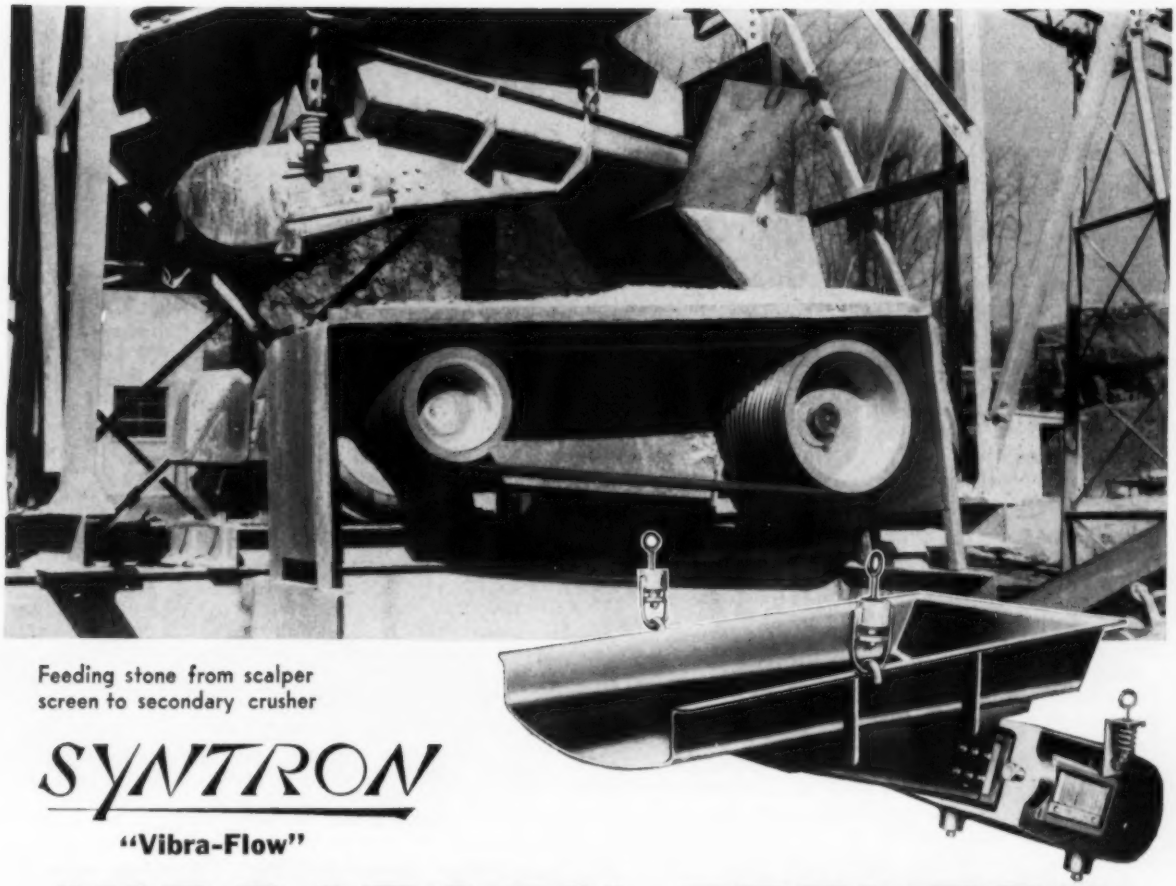

Feeding stone from scalper screen to secondary crusher

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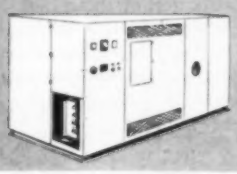

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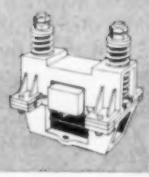
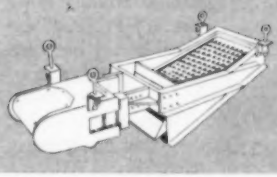


VIBRATING SCREENS



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The Editor's Page

Highway Program Progressing Satisfactorily

THE growing feeling that the new National Highway Program is bogging down cannot be justified by the facts, which show that, on the contrary, the program is progressing satisfactorily in all respects and should continue to do so. According to the Bureau of Public Roads, all of the Federal Aid Highway Programs—interstate, primary, secondary and urban—are progressing "on schedule" and "in balance." The Interstate Program, as of October 21, shows approximately $3,000,000,000 in federal and state funds "in the pipeline"—that is, projects programmed, authorized for engineering or acquisition of rights-of-way, advertised for bids, under contract, or in actual construction. The Primary, Secondary and Urban programs show in excess of $2,800,000,000 in federal and state funds similarly programmed.

Also, according to the Bureau, as of October there were 53 construction projects already completed, 704 projects awarded to contract, and 110 additional projects advertised for bids. A total of over $1,000,000,000 (federal and state funds) was committed for the projects on which contracts had been awarded. Over $175,000,000 were involved in contracts advertised but not yet awarded; and "in the works" were projects previously programmed, requiring $660,000,000 for rights-of-way and $219,000,000 for preliminary engineering.

That the financial side of the program is also up to expectations is evident from a recent report from the Treasury Department, which states that the estimated amount expected to be paid into the Highway Trust Fund in fiscal year 1958 will total $2,185,000,000. This represents a $115,000,000 rise over the Treasury's estimate made in February, 1957. Expenditures from the Trust Fund for highway construction during fiscal year 1958 are expected to be $1,806,000,000. This represents an increase of 87 percent over the $966,000,000 paid out from the Fund during fiscal year 1957. The indicated balance at the end of the fiscal year will be $895,000,000.

ACCORDING to Sinclair Weeks, Secretary of Commerce, the 40,000-mile Interstate System was recently expanded to 41,000 miles, as authorized by the Federal-Aid Highway Act of 1956. This additional mileage was apportioned throughout the country so as best to fit both civilian and military needs. In addition to this 1,000-mile expansion, another 1,102 miles was made possible by estimated savings in mileage resulting from the adoption of more direct locations of routes previously designated.

In discussing the impact of the national roadbuilding program recently, Major General Louis W. Prentiss, executive vice-president of the A.R.B.A., said that between now and 1972 the entire program will use 50,000,000 tons of steel, 1,500,000,000 barrels of cement, 130,000,000 tons of bituminous material, 10,000,000,000 tons of aggregates, etc. Strictly in the line of heavy construction equipment, he said, manufacturers are anticipating a rise in sales of 150 percent or more when maximum demand is reached.

The negative attitude towards the highway program in some quarters can be blamed partly on the early over-optimism as to the speed with which it could go into effect and the added demand which it would create. The general impression was that the additional materials, machinery, and supplies needed in the program would have to be available on comparatively short notice. As a result some manufacturers of the machinery required are overstocked, and the cement industry has built capacity which in some areas will not be needed for several years.

ALSO responsible was the general lack of knowledge of the time required for such a program to attain momentum. Officials state that the average complex interstate project requires a "lead time" of 21 months from the time it is conceived until it is put under contract. This time, between authorization and dirt moving, is needed for route location, land acquisition, engineering, design, and awarding of contract. It then takes an average of 24 months to finish the actual work and open the road to traffic as a completed facility. Therefore, we must allow nearly four years as the life of an average interstate road project.

As is always the case when large sums of money are made available for any purpose, attempts are made to divert some of it for purposes other than those intended. Such raids on the road funds have already been attempted, but with little success, and we are assured that they will fare no better in the future. The Bureau of Public Roads has anticipated the potential misuse of these funds, especially in the acquisition of rights-of-way, and has taken steps to safeguard the public interest.

THE first such effort was made by the Department of Labor, which asked for $365,000 to make wage determinations in accordance with the Davis-Bacon Act. Then came an apparently organized drive by utility companies to obtain reimbursement for relocating their facilities along the rights-of-way of the highway system. This move met with some success in some states. Mass transit systems are now trying to get some of this money on the pretext that mass transportation is a part of the overall highway problem.

The highway program definitely is not bogging down. It is moving along on a realistic schedule in spite of some terrific handicaps which have had to be overcome. High right-of-way cost is a major problem. The record-breaking rainfall, temporary cement shortages due to the nationwide strike this summer, and the shortage of engineers also delayed the program in some areas. The industries supplying materials for the construction of these highways should really begin to feel the impact of this demand in 1958, and there should be no letdown for many years to come. The only real threats to the program are extraneous ones, and everyone interested in it should be on the watch at all times to help circumvent them.

Walter E. Trautfer

MORE THAN 700 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

BEAT THE DUST PROBLEM AND BOOST YARDAGE

Flying dust is no measure of getting yardage in a sand pit. But you can minimize this problem—keep your equipment in action—by lubricating on schedule with *Texaco Marfak*.

This world-famous chassis lubricant seals out dust and dirt, seals itself in the bearings... prevents rust. Its tough film stays put under heavy loads, keeping wear at a minimum.

On wheel bearings, use all-weather *Texaco Marfak Heavy Duty 2*. It provides extra protection against dirt and moisture, and assures safer braking for thousands of extra miles. No seasonal change required.

Or you can use just one lubricant, *Texaco Marfak Heavy Duty Special 2*, for chassis, wheel bearing, water pump and other grease lubrication. This lithium-base, multi-purpose grease resists water washout, stands up in the toughest service—always pumps easily at low temperatures.

Using *Texaco Track Roll Lubricant* on rollers assures smooth-running operation and complete protection against both rust and wear.

Your Texaco Lubrication Engineer is specially trained to help keep contractors' equipment running smoothly under all conditions. You can contact him by calling the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Washington News Letter

By S. HERBERT UNTERBERGER

Here in Washington the close relationship between economics and politics has become an acknowledged fact. In practically every discussion of the next congressional election, the connection between the economic downturn of 1953 and the Republicans' loss of control of Congress in 1954 is recalled, sometimes bitterly and sometimes gleefully, depending on the discussants' political affiliations. The similarity in the economic climates of 1953 and 1957 are sufficient to give many a Republican politician sleepless nights.

In 1953, also, the economy was described as being in a sidewise movement; that is, it was engaged in neither a broad-scale upward movement nor a widespread decline. To be sure, there were bright spots and trouble spots. In 1953 the bright spots were generally associated with the durable goods industries and the trouble spots with the non-durable, generally soft goods, industries.

Much of the current literature describes the 1957 situation in the same vein. The term "sidewise movement" may be out of vogue, but the new term "uncertain stability" really means just about the same thing. At present there are also bright spots and trouble spots. However, the trouble spots appear to be more closely associated with the durable goods industries; and, curiously, the bright spots are frequently found among the non-durable goods industries. Whether this is better or worse from the standpoint of the economy's future, no one seems to know.

In every such period of uncertain stability, opposing schools of thought are sure to arise, and 1957 is no exception.

Washington, currently, is witnessing the growth of such schools of thought. At the moment the various agencies and their staffs seem to be choosing up sides. For some time, practically every voice in Washington was raised in behalf of fighting inflation, maintaining the integrity of the dollar, keeping the price level from rising, etc. This situation appears to be changing rapidly. There are still those who maintain ever so stoutly that the problem of inflation is far from licked, and that, until this is done, this fight must command the Administration's first attention.

Of necessity, anti-inflationary measures must involve the restriction of business growth. High taxes and high interest rates, certainly, can have no other effect. By now, however, the opposite camp—those who think that the time is approaching, or has already passed, when policies to restrict business growth should be abandoned in favor of policies designed to stimulate such growth—has a significant number of adherents and is steadily growing.

Leading the camp of those who continue to regard inflation as the No. 1 economic problem is the Federal Reserve Board. The most prominent group on the opposite side—those who favor switching to a policy designed to stimulate economic growth—are the President's Council of Economic Advisers.

The Federal Reserve Board's position is really very simple. Numbers of this group point to the fact that the cost of living has been rising at an exceedingly rapid rate, and that from all indications it will continue to rise for some time. Thus, they say, inflation is upon us and nothing can do more harm to more people than run-away rising prices. Up to this point, the politicians are with them. They are fearful of the housewife's reaction, as expressed by her vote in November, to rising prices for food, clothing, and their other consumer items.

The position of the Council of Economic Advisers is almost equally simple. Those in this camp point to the fact that a decline in prices, which the Federal Reserve Board would appear to find desirable, and even stable prices which they would be willing to settle for, cannot be accomplished without some decline in production and employment. Reduced output and employment they regard as a most serious consequence and one which could start a full-fledged down-turn, possibly accompanied by disastrous results. To avoid those consequences, action is required now before it is too late. The politicians also agree with this position. While rising prices at election time are a serious matter to a party trying to stay in power, or to get into power, unemployment of any magnitude is a disaster.

Unfortunately, neither the politicians nor anyone else can have it both ways. Policies that suit the position of the Federal Reserve Board are unlikely to suit the position of the Council of Economic Advisers.

The notion is beginning to dawn on a large number of people, that in a capitalist economy it may not be possible to achieve both full employment and stable prices. This may be what Harvard's Professor Sumner Slichter has been saying for some time, to the acute discomfort of conservative business men and their representatives on the Federal Reserve Board. He appears to have been saying that small price rises, about 1 or 2 percent a year, are essential if full employment is to be achieved. He knows as well as anyone else that such prices have their most serious adverse effect on people with fixed incomes, for example, retirees, school teachers, public servants, etc. Nevertheless, he regards the adverse effect in those areas as a price that must be paid and one that is probably worth paying for full employment. It is likely that the politicians would agree with him on this general principle.

At the moment, the debate is being conducted on a rather high level. The forum is a committee organized to review the overall economic policy. It consists of the Secretary of the Treasury, the Chairman of the Council of Economic Advisers, the Presidential Assistant for Economic Affairs, and the Chairman of the Federal Reserve Board. In so far as possible, these men are probably trying to make the most objective evaluation of the problem, based upon the best available economic intelligence.

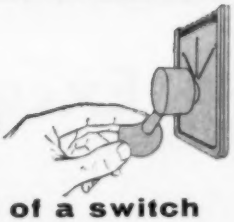
But this ivory tower approach will probably not be long sustained after Congress comes back into session in January. Then the political aspect

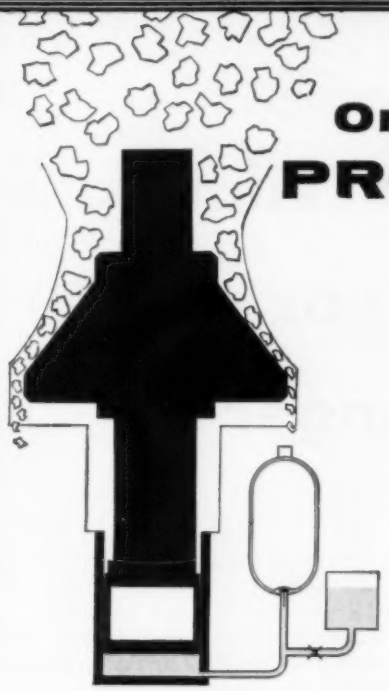
(*Continued on page* 108)

The only crusher that provides

One-Man, One-Minute PRODUCT CONTROL

GET
ANY
CRUSHER
SETTING
at the flip of a switch





It's Hydraulic

Cone is supported on a hydraulic jack. Crusher setting is controlled by the amount of oil in the jack. A flip of a control switch, conveniently located, positions the cone at any setting.

Adjustment to product size . . . compensation for wear . . . emergency unloading — all are one-man, one-minute operations — all are accomplished with a flip of a switch in the *Hydrocone* crusher. Compare this speed and simplicity with the time-consuming inconvenience of any other method of changing crusher setting—in any other gyratory type crusher. You'll discover that the *Hydrocone* crusher can actually add production hours to your day . . . can give you increased tonnage and greater profits by eliminating excessive downtime.

New Bulletin Available

Bulletin 07B7145C tells the complete *Hydrocone* crusher story. Get your copy from your nearby A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

Hydrocone is an Allis-Chalmers trademark.

Hydrocone CRUSHER

A-C ALLIS-CHALMERS

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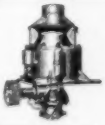
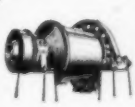
A-5261

Hammermill

Vibrating Screen

Jaw Crusher


Gyratory Crusher


Grinding Mill

Kiln, Cooler, Dryer

PREVENTIVE MAINTENANCE REPORT

Dayton Cog-Belts* Eliminate Excessive Belt Wear ...Last 8 Times Longer

"We'd taken it for granted that rock crushing operations meant a certain amount of excessive belt wear," reports D. B. Guy, Superintendent of Weston and Brooker's Granite Hill Plant at Sparta, Ga. "But, we were away over budget when we had to replace two complete sets of 17 belts on our primary jaw-crusher in a short 10 months.

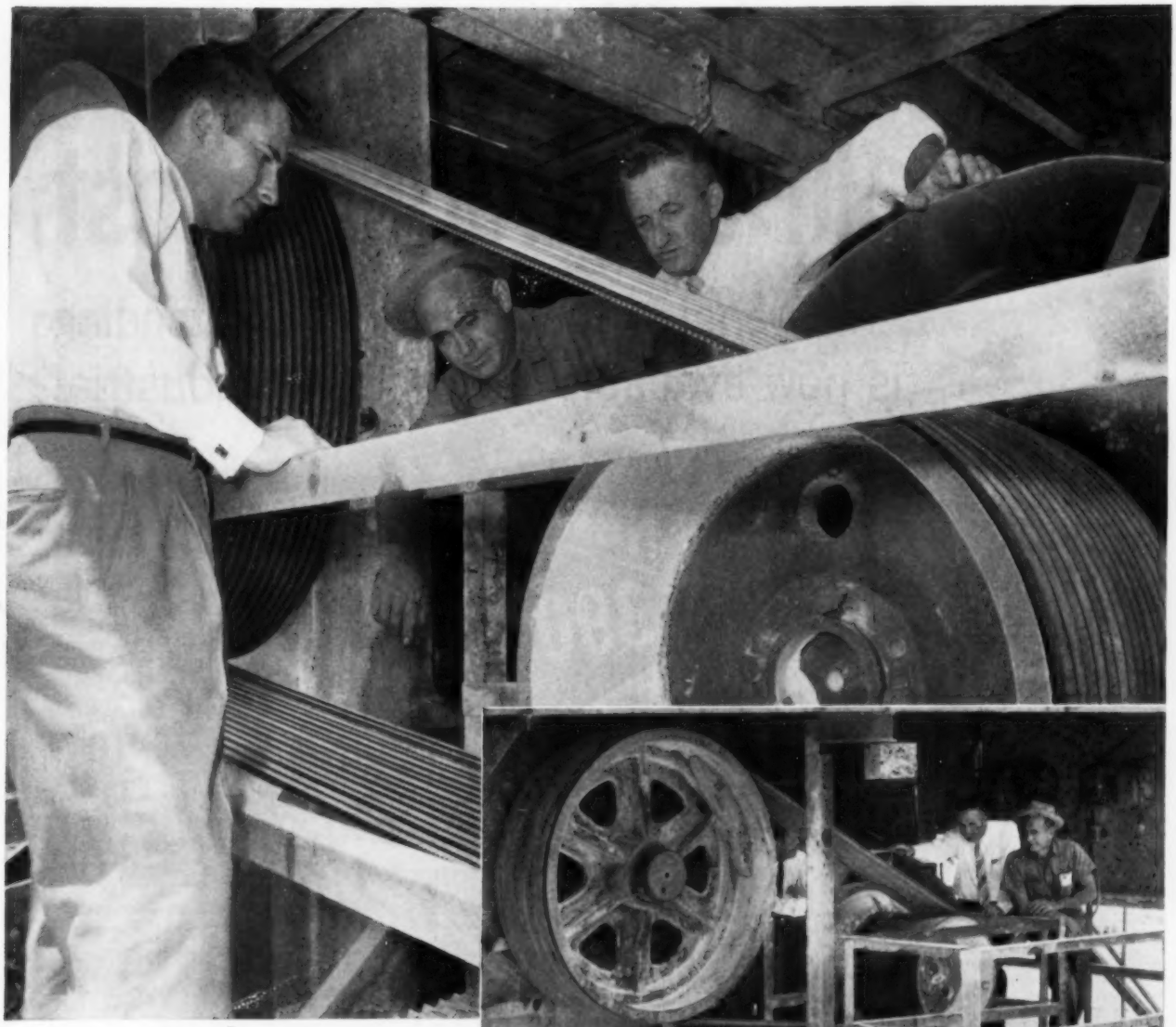
"Then, 45 months ago, we switched to Dayton "C" Section Cog-Belts*. Thus far, they've saved us the cost of 125 conventional belts and it looks like the Cog-Belts will last at least another year.

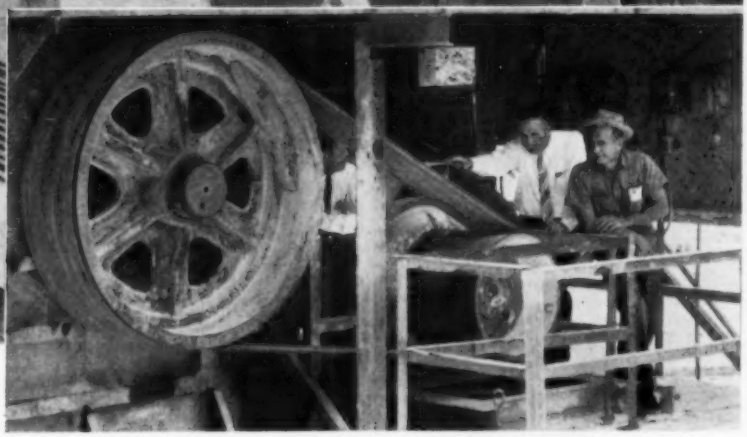
"At the same time, Cog-Belts have reduced the time spent in adjusting the belts from 80 minutes to a mere 5 minutes a week.

"Our troubles started the moment rock particles and pebbles worked themselves under the cover of the conventional belts. Trapped there, these particles distorted the belt, tore the strength-giving cords, and eventually weakened the belt to the point where it snapped. You can imagine the wear on the drive sheave caused by the imbedded particles and the slippage they created.

"You won't find this happening with Cog-Belts. The unique construction of the Cog-Belt actually carries stones and chips out of the sheave grooves before they have a chance to build up and imbed themselves into the body of the belt. Even the finer dust, which wears away the fabric on a conventional belt, has no effect on the raw-edge sides of a Cog-Belt. It's simply absorbed into the composition of the rubber where it can do no harm. No wonder Dayton Cog-Belts have given us at least 8 times more service than any other belt."

For more information and help in solving your power transmission problems, see BELTING in the Yellow Pages for the name and phone number of your nearest Dayton Distributor. Or, write The Dayton Rubber Co., Industrial Replacement Div., Dayton 1, Ohio.





◀ Magnified view of patented Dayton Cog-Belt shows molded cogs that help keep sheave grooves clear of harmful dust, and raw edges that give greater traction and yet resist damage by abrasive materials.

This matched set of 17 Dayton Cog-Belts is still in good condition after 45 months of service on a rock crusher with a capacity of 1200-1800 tons a day. Belts used previously lasted only 5 months on this 125 h. p. drive which is burdened by occasional slug loads of 150 h. p. Plant Superintendent D. B. Guy is at the right. (Top, left to right: Ellis Chambliss, of Bearings & Drives, Dayton Distributor at Macon, Ga.; D. B. Guy; and F. M. Burt, Dayton Representative.) ▲

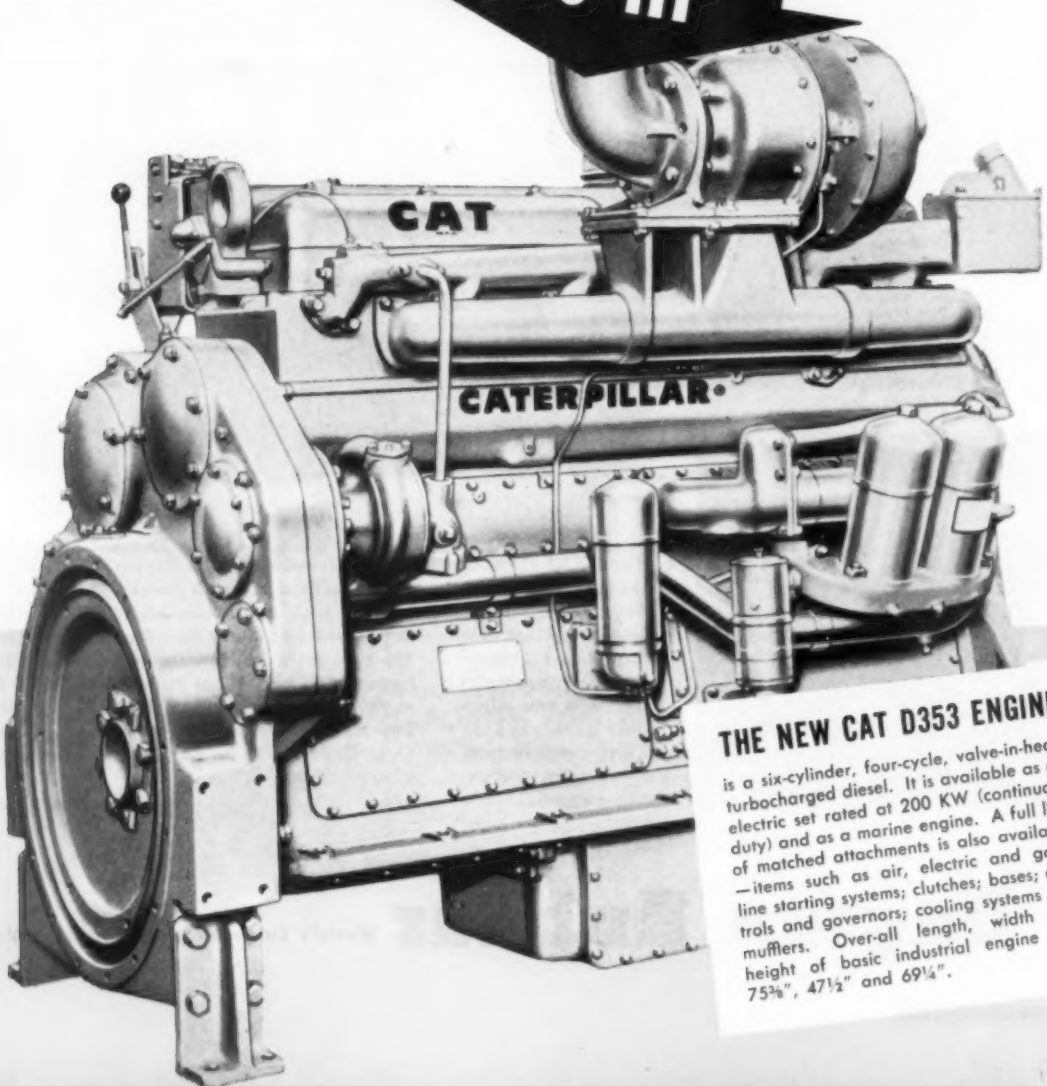
*T.M. ©D.R. 1957

Dayton Rubber *World's Largest Manufacturer of V-Belts*

Caterpillar announces in the world's most

The engine that delivered outstanding is now available as the D353 Industrial

D397 650 HP† | D375 430 HP† | **New D353 390 HP†** | D342 225 HP† | D339 140 HP†



THE NEW CAT D353 ENGINE

is a six-cylinder, four-cycle, valve-in-head turbocharged diesel. It is available as an electric set rated at 200 KW (continuous duty) and as a marine engine. A full line of matched attachments is also available—items such as air, electric and gasoline starting systems; clutches; bases; controls and governors; cooling systems and mufflers. Over-all length, width and height of basic industrial engine are: 75⅜", 47½" and 69¼".

another heavy-duty engine advanced line of diesels

performance in the famous D9 Tractor Engine, Electric Set and Marine Engine

D337	D326	D318 (SERIES G)	D315 (SERIES G)	D318	D315	D311
310 HP†	200 HP†	175 HP†	115 HP†	137 HP†	91 HP†	65 HP†

†Maximum output capacity

Adding to Caterpillar's line of modern heavy-duty engines, there's now the Turbocharged D353 rated at 390 HP (maximum output capacity). This engine, a prototype of the unit in the mighty D9 Tractor, is job-proved after thousands of hours of operation in the field!

Like all modern CAT* Diesels, the D353 incorporates in its design the advanced features developed by Caterpillar in a quarter century of diesel leadership. Compact and sturdy, it is built for the hard work. Its four-cycle design delivers the long, effective power stroke that puts power to more efficient use than other types of engines. Its turbocharger utilizes waste energy from the engine exhaust to increase over-all efficiency and economy. Its fuel system requires no adjustment. There are no cylinder ports to clean. And its exclusive Caterpillar single-orifice injection valves, combined with the precombustion chambers, permit the use of a wide range of fuels including premium diesel fuels as well as low-cost No. 2 furnace oil *without fouling*. All these and other features add up to performance that no unit in its power class can match.

With the addition of the D353 to the Caterpillar Engine line, you now have a wider choice than ever for your requirements. Engines are available up to 650 HP (maximum output capacity) and electric sets up to 350 KW (continuous duty). Either as original or replacement power, there's one among hundreds of different arrangements that exactly meets your needs. Leading manufacturers of machinery can supply these models in the equipment they build.

For complete information about the new D353 and other Cat Diesels, see your Caterpillar Dealer. Let him show you how diesel leadership based on a quarter century of experience can engineer the modern, heavy-duty diesels of tomorrow.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar "Firsts" in a Quarter Century of Diesel Leadership

- "Hi-Electro" hardened cylinder liners
- Chemically conditioned cylinder liners
- Stainless-steel piston protectors
- Aluminum alloy bearings
- Interchangeable, adjustment-free fuel injection equipment
- Capsule-type injection valves
- Service meters
- Superior lubricants (detergent oils)
- Notarized, certified power

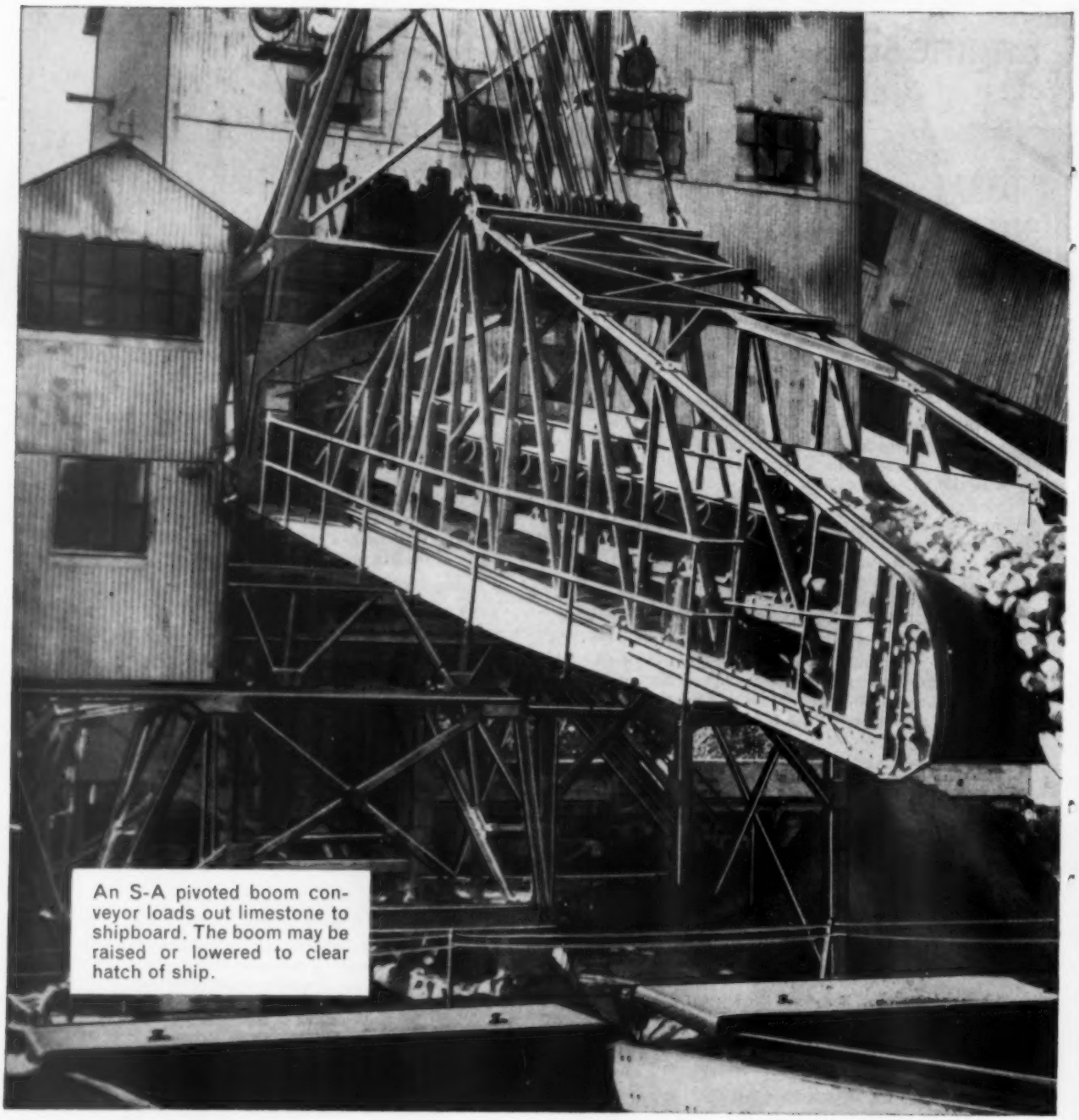
AND MANY MORE!

Certified Power for Cat Diesel Engines

Through the years, Caterpillar Engines have earned a reputation for *honestly rated power*. Now Caterpillar backs this reputation with a *notarized certificate* covering the horsepower capabilities of each engine. Caterpillar is the first and only manufacturer to give you this assurance of capacity. You have a right to demand *certified power* when you invest in an engine. You get it when you buy from your Caterpillar Dealer!

STEPHENS-

are rock product



An S-A pivoted boom conveyor loads out limestone to shipboard. The boom may be raised or lowered to clear hatch of ship.

-ADAMSON

conveying costs hard to handle?

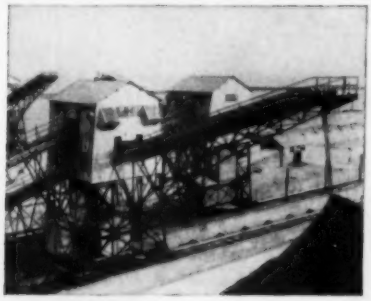
Makeshift arrangements of conveying equipment multiply bulk material handling problems. Such hybrid creations just won't move aggregate tonnages as economically or efficiently as a properly engineered system will.

STEPHENS-ADAMSON engineered systems go into operation only after close examination of the moving and processing problem, and when they do, product tonnages go up, operating costs come down.

Standing against this background of engineering talent is the finest array of manufactured conveyor and material handling equipment that 56 years of experience and development can provide. These are the tools the S-A engineer incorporates into a system that won't knuckle under to any rock handling assignment.

Let the STEPHENS-ADAMSON representative in your area tell you about what so many operators know from experience, why it pays to convey the S-A way.

Huge traveling stackers discharge limestone to storage piles up to a maximum height of 80 ft. A network of reclaiming conveyors are installed beneath the piles. The stackers moving on rails, serve as gigantic trippers.



Two of the four giant stackers used by Inland Lime and Stone Co. This equipment piles up tremendous tonnages, discharges stone at any point along the track. S-A builds equipment to handle any rock product from the finest material to heaviest, roughest lumps.

SINCE 1901 S-A STEPHENS-ADAMSON MFG. CO.

STEPHENS-ADAMSON MFG. CO.

20 RIDGEWAY AVENUE, AURORA, ILLINOIS
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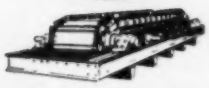
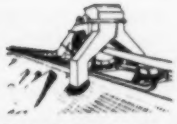
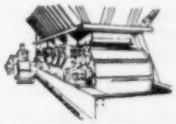


PAN CONVEYORS

BELT CONVEYORS



BELT CONVEYOR TRIPPERS



MANGANESE STEEL PAN FEEDERS

S-A manufactures a wide range of material handling products in three complete plants in U. S. and Canada.

- Belt Conveyors
- Belt, Pan and Plate Feeders
- Ship Loading Boom Conveyors
- Stacking Conveyors
- Storage and Reclaiming Systems
- "Natural Frequency" Vibrating Conveyors
- REDLER Conveyor-Elevators
- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
- Headshaft Holdbacks
- Grizzlies and Screens
- Centrifugal Pilers
- Bin Gates and Tunnel Gates
- Car Pullers and Spotters
- Bucket Elevators
- Skip Hoists
- SEALMASTER Ball Bearing Units

• *Write for a bulletin on any of the above products.*

New Ringblaster "Muffler" swallows blast noise!

Now . . . firing noise is cut by 60% with this exclusive Winchester-Western kiln gun extra!

This Ringblaster muffler was designed by experts, tested by acoustical engineers and found to reduce kiln gun blasts to a low, safe sound level with normal ear protection. The three-stage baffle built into this muffler reduces loudness by 60% and sound intensity by 75%*. It gives kiln gun operators a measure of sound-safety never before possible.

"A terrific improvement!" . . . "Why wasn't it done before!" . . . these are typical of the many favorable comments made by new users of the quieter, more efficient Ringblaster with its muffler.

And this safety-extra is so compact, it doesn't impair aiming or firing accuracy . . . doesn't block kiln doors—it fits around the heavy-duty Ringblaster barrel, sealing in the sound.

Ringblaster is the *only* kiln gun that comes factory-equipped with a muffler. It also features a short stroke lever for faster firing action. Write for new catalog.

*As tested by an independent laboratory.

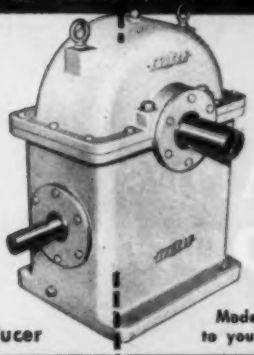
TRADEMARK
RINGBLASTER *Kiln Gun*

FOR SHELLS, SERVICE OR EQUIPMENT CONTACT:
Ramset Fastening System
CLEVELAND 11, OHIO

Made by WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
EAST ALTON, ILLINOIS

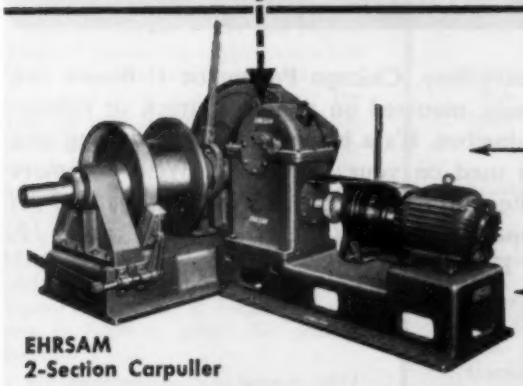
12175-II BEREA ROAD • CLEVELAND 11, OHIO

for every Class of Service... EHRSAM



Style W
Speed Reducer

9 Standard
Models—Also built
to your specification



EHRSAM
2-Section Carpuller

Handles, spots all types freight cars on spurs, sidings. In two sections, easily assembled. Manual or remote control. Full power, torque range. *Get detailed specifications!*

SPEED REDUCERS TIE POWER to LOAD with GREATER EFFICIENCY

EHRSAM'S new Style W Speed Reducers deliver highest possible work efficiency to the job. You can use these tough, compact units in a complete range of service: *normal, intermittent and heaviest shock-load.* (We use this new Speed Reducer in special-application units, such as the EHRSAM 2-Section Carpuller.) New design features include alloy steel shafts, precision-ground steel worm and alloyed bronze gear; and all castings of extra-tough EHRSAM Micrometal.

The new EHRSAM Style W Speed Reducers give you increased operating efficiency, reliable protection to expensive equipment throughout your plant.

The new Style W Speed Reducer is the rugged, efficient heart of the EHRSAM Carpuller

Write for Complete Catalogs, full specifications

EHRSAM®

Over 80 Years of Dependable Service

THE J. B. EHRSAM & SONS MFG. CO.

Dept. Q—Enterprise, Kansas

SALES OFFICES: Atlanta, Georgia; Denver, Colorado; Kansas City, Kansas
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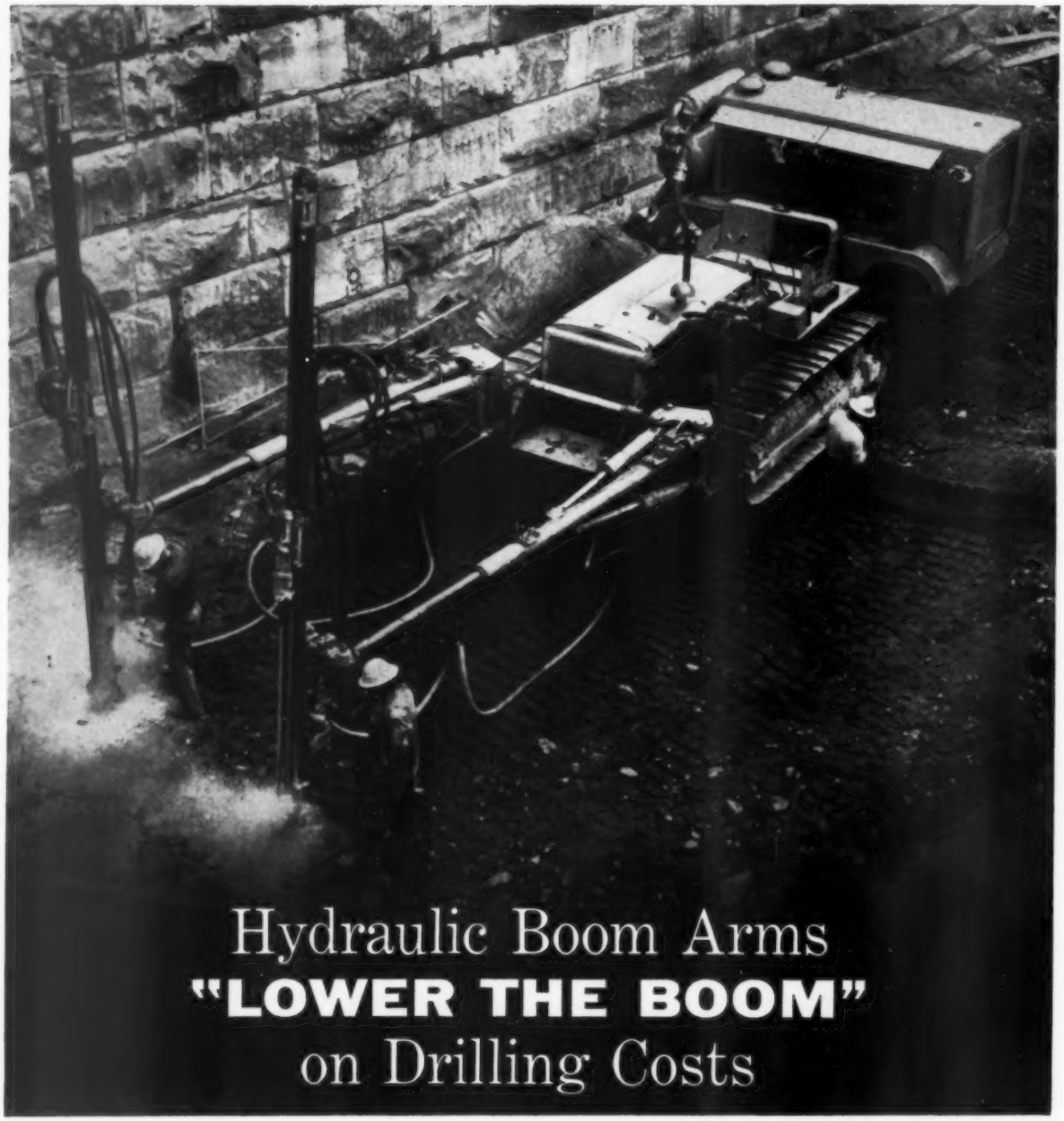


Hydraulic Boom Arms "LOWER THE BOOM" on Drilling Costs

H-Booms have extra-capacity, double-acting hydraulic cylinders that retract and extend, swing or elevate in a hurry—yet pressures are moderately rated. There's no creeping or drifting! Boom can be extended 6 feet . . . that's an extra foot of length to afford better spacing of holes and greater area coverage without moving the rig.

Heavy-duty, Chicago Pneumatic H-Booms can be easily mounted on mine car, track or rubber-tired jumbos. It's a highly productive drilling unit when used on your old tractor. Write for more detailed information. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

News of the Industry

Harry W. Baumgartner, Founder of Pit and Quarry, Dies After Long Illness

Harry W. Baumgartner

It is with the deepest sorrow that we announce the passing of Harry W. Baumgartner, founder and for many years president of PIT AND QUARRY PUBLICATIONS. He died on October 13 at Wesley Memorial Hospital in Chicago after an extended illness. Ill health forced Mr. Baumgartner's retirement from business in 1945, and for the last several years he had been an invalid.

Mr. Baumgartner had had several years of publishing experience when in 1916 he founded the present company and became its president. PIT AND QUARRY began as a pocket-size magazine, and remained in this format for many years. Originally published as a quarterly, it was later changed to a bi-monthly, then in 1918 to a monthly magazine. Under Mr. Baumgartner's management, and with the growth of the pit and quarry industries, it became necessary in 1926 to adopt the present format.

Mr. Baumgartner was born in 1874 in Geneseo, Ill., the youngest son of Joseph and Pauline Volland Baumgartner, who settled in Geneseo over 100 years ago. He was a member of the Englewood Methodist Church (Chicago). He was also a member of the Union League Club of Chicago.

His association with the Y.M.C.A. covered a period of more than 50 years. As a young man, he worked with Dr. James Naismith, inventor of basketball, in popularizing the sport in the Midwest. He played forward on one of the first Y teams in Chicago.

Survivors are a daughter, Lanetta B. Smith (Mrs. Ray Jr.), four grandchildren, and two great-grandchildren.

National Gypsum Purchases Gypsum Products Plant

The National Gypsum Company, Buffalo, N. Y., has purchased the gypsum products plant of Connecticut Adamant Plaster Company in New Haven, Conn. Although the price was not disclosed, unofficial sources estimated the purchase involved over $1,000,000.

The Connecticut plant has a capacity to produce enough gypsum to supply about 30,000 homes a year. Adamant also owns a gypsum deposit in Nova Scotia, Canada.

Coming Events

January 19-23, 1958 — Chicago. Convention and exposition, National Association of Home Builders. Conrad Hilton and Sherman Hotels and the Coliseum.

January 20-23, 1958—Washington, D.C. 13th annual convention, National Agricultural Limestone Institute. Hotel Statler.

January 24, 1958—Washington, D.C. Third annual convention, National Crushed Limestone Institute. Hotel Statler.

January 26-30, 1958— Chicago. 39th Annual Meeting, Associated Equipment Distributors. Conrad Hilton Hotel.

February 3-6, 1958—Las Vegas, Nev. Third annual convention, National Bituminous Concrete Association. Flamingo Hotel.

February 9-12, 1958 — Washington, D. C. 8th annual convention and show, Mason Contractors Association of America. Sheraton-Park Hotel.

February 10-13, 1958—Chicago. 42nd annual convention and exposition, National Sand and Gravel Association. Conrad Hilton Hotel and Chicago Coliseum.

February 10-13, 1958—Chicago. 28th annual convention, National Ready Mixed Concrete Association. Conrad Hilton Hotel and Coliseum.

February 10-14, 1958—St. Louis. Committee Week, American Society for Testing Materials. Hotel Statler.

February 17-19, 1958—Chicago. 41st annual convention, National Crushed Stone Association. Conrad Hilton Hotel.

February 17-20, 1958—Chicago. 38th annual meeting, National Concrete Masonry Association. Sherman Hotel.

February 24-27, 1958—Chicago. Annual meeting, American Concrete Institute. Morrison Hotel.

Construction Contracts Down 5% in August—8-Month Volume Up 2%

Contracts for future construction in the United States totalled $2,817,966,000 in August, a decline of 5 percent from the comparable month last year, the F. W. Dodge Corporation, construction news and marketing specialists, reported. For the first 8 months of 1957, the cumulative total of construction contracts amounted to $22,676,652,000, up 2 percent over the corresponding 1956 period.

August contracts for non-residential buildings were valued at $1,008,265,000, an increase of 8 percent over August, 1956. Commercial manufacturing, educational, hospital, and religious buildings all registered gains over a year ago. Non-residential building contracts for the first 8 months of 1957 totalled $7,939,670,000, up 3 percent over the first 8 months of 1956.

Residential building contracts in August totalled $1,283,513,000, an increase of 5 percent over August, 1956. A substantial gain in contracts for multi-unit dwellings more than offset the 1 percent decline reported for one- and two-family houses. The number of dwelling units represented by the August contracts totalled 96,965, up 1 percent over a year ago. For the first 8 months of this year, residential building contracts were valued at $9,053,764,000, down 1 percent from the comparable 1956 period. These contracts represented 692,151 dwelling units, a decline of 7 percent from a year ago.

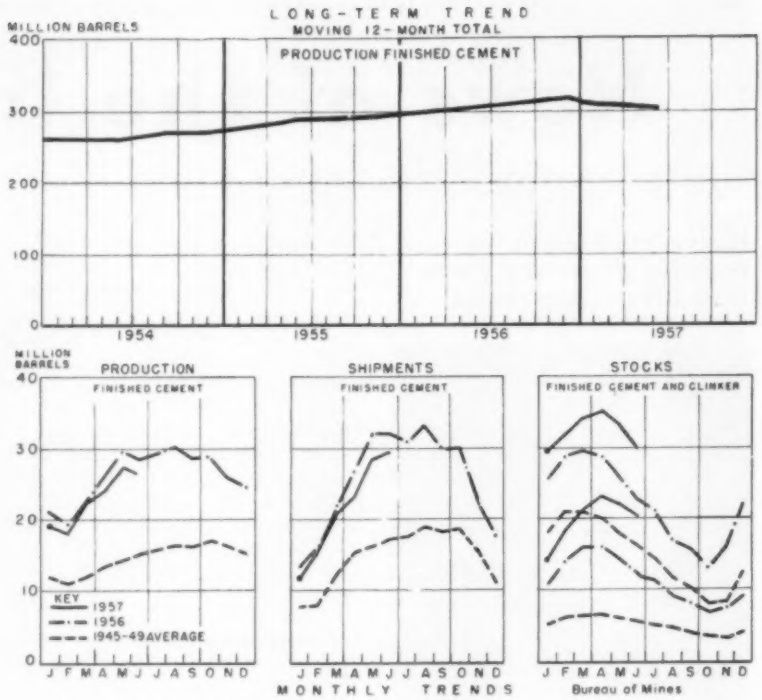
Contracts for heavy engineering in August amounted to $526,188,000, down 34 percent from the corresponding month of 1956. For the first 8 months of 1957, the cumulative total of heavy engineering contracts was reported to be $5,683,218,000, an increase of 7 percent over the first 8 months of last year.

First American Ytong Plant Planned for Tacoma, Wash.

The first Ytong plant to produce Swedish lightweight block and building material in the United States will be built in Tacoma, Wash., according to J. G. Ortengren, manager of this new company.

Estimated cost of the plant will be $1,300,000. No cement is used in Ytong. Lime and pozzolan are the only cementitious materials.

EDWARD CURRIE, 28, who was assistant sales manager of the Marquette Cement Company at Brandon, Miss., died on October 2 in a hospital in Jackson, Miss.



SUMMARY—Production of finished portland cement in June, 1957, as reported to the U. S. Bureau of Mines totaled 26,462,000 bbl., a decrease of 8 percent from June, 1956. Mill shipments in June, 1957, totaled 29,545,000 bbl., a decrease of 8 percent compared with June, 1956. Stocks of 29,880,000 bbl. of finished portland cement on hand June 30, 1957, were 32 percent more than those on hand June 30, 1956. Clinker production during June, 1957, totaled 24,586,000 bbl., a decrease of 9 percent from the June, 1956, figure.

PRODUCTION—One hundred and fifty-two (152) plants in 37 states and Puerto Rico reported a production of 26,462,000 bbl. of finished portland cement during June, 1957, compared with 28,771,000 bbl. in June, 1956. The ten plants shut down by strike in May continued idle during June, and three other plants in the Lehigh Valley of Pennsylvania were shut down by strikes in the last week of June.

Clinker production during the month of June, 1957, was 24,586,000 bbl. compared with 27,053,000 bbl. during the same month last year.

High-early-strength portland cement production in June, 1957, of 796,000 bbl. increased 16 percent over the June, 1956, production.

Production of prepared masonry cement was 1,132,000 bbl. during June, 1957, a decrease of 19 percent from the June, 1956, production.

SHIPMENTS—Mill shipments of finished portland cement for June, 1957, totaled 29,545,000 bbl. compared to 31,996,000 bbl. in June, 1956.

In June, 1957, shipments were higher in nine (9) districts and lower in fourteen (14) districts than in June, 1956. The greatest increases were in the Virginia-South Caroline and Puerto Rico districts. The greatest decreases were in the Tennessee and Georgia-Florida districts.

Mill shipments of high-early-strength portland cement totaled 1,078,000 bbl. in June, 1957, an increase of 1 percent over the 1,071,000 bbl. shipped in June, 1956. Over half of these shipments were from mills in three (3) districts, eastern Pennsylvania-Maryland, Michigan, and Alabama. No shipments were made from mills in Puerto Rico.

Mill shipments of prepared masonry cement in June, 1957, totaled 1,362,000 bbl., a decrease of 12 percent from the 1,545,000 bbl. shipped in June, 1956. Nearly two-thirds of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-pound barrels although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 29,880,000 bbl. of finished portland cement were on hand June 30, 1957, an increase of 32 percent over the 22,685,000 bbl. on hand June 30, 1956. Stocks of clinker increased 62 percent from 12,537,000 bbl. on June 30, 1956, to 20,324,000 bbl. on June 30, 1957.

FIRST SIX MONTHS—For the January-June period this year, the volume of production of finished cement amounted to 137,703 tons, compared with 148,915 tons in the same period of 1956. Total shipments for the first six months of 1957 are repored as 129,069 tons; in 1956 (January-June period) the total shipments were 142,294 tons.

Ideal Cement Company, Denver, Colo., has acquired the plant and assets of Northwestern Portland Cement Company, Seattle, Wash., in exchange for 38,756 shares of capital stock of Ideal which will be distributed to Northwestern stockholders in liquidation of the corporation.

Australian cement production increased a record 10 percent in 1956. Output in 1956 was 2,138,000 tons.

LOOK BELOW the SURFACE...

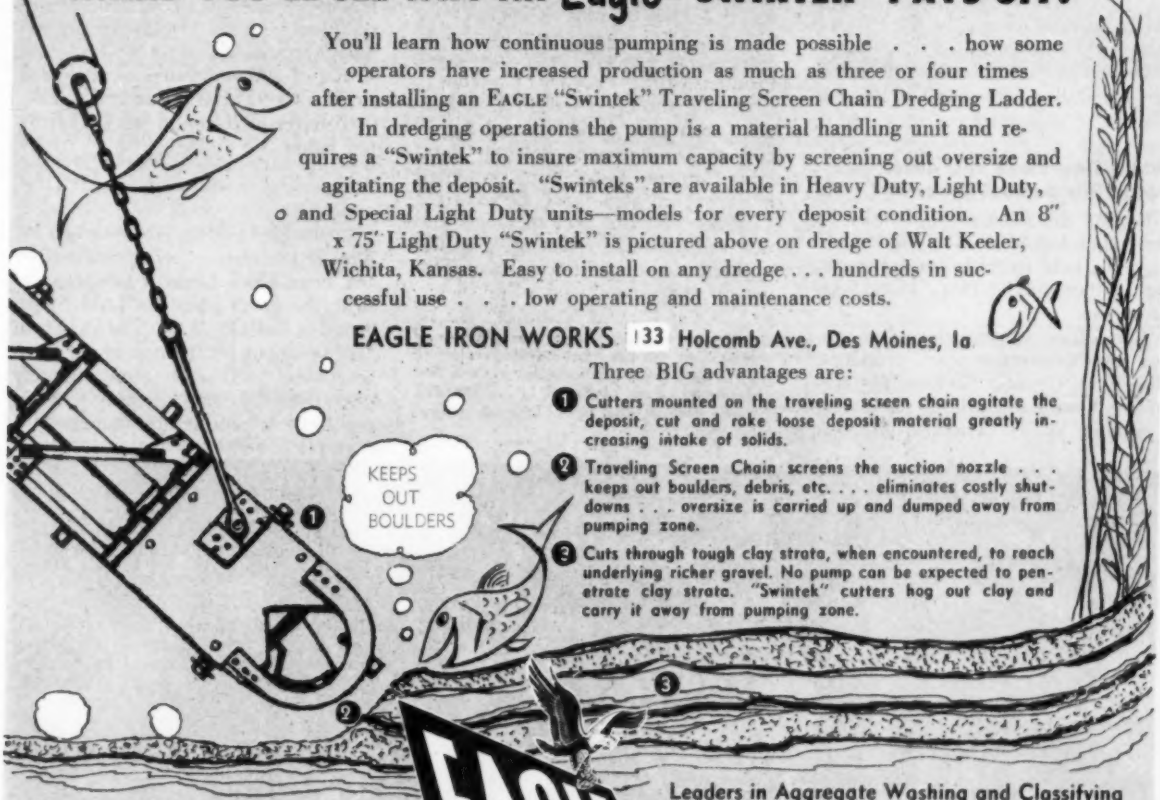
...AND YOU'LL SEE WHY AN Eagle "SWINTEK" PAYS OFF!

You'll learn how continuous pumping is made possible . . . how some operators have increased production as much as three or four times after installing an EAGLE "Swintek" Traveling Screen Chain Dredging Ladder. In dredging operations the pump is a material handling unit and requires a "Swintek" to insure maximum capacity by screening out oversize and agitating the deposit. "Swinteks" are available in Heavy Duty, Light Duty, and Special Light Duty units—models for every deposit condition. An 8" x 75' Light Duty "Swintek" is pictured above on dredge of Walt Keeler, Wichita, Kansas. Easy to install on any dredge . . . hundreds in successful use . . . low operating and maintenance costs.

EAGLE IRON WORKS 133 Holcomb Ave., Des Moines, Ia

Three BIG advantages are:

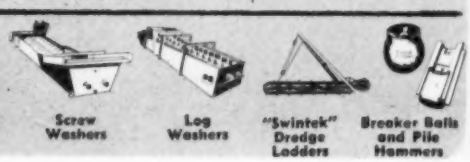
1. Cutters mounted on the traveling screen chain agitate the deposit, cut and rake loose deposit material greatly increasing intake of solids.
2. Traveling Screen Chain screens the suction nozzle . . . keeps out boulders, debris, etc. . . . eliminates costly shutdowns . . . oversize is carried up and dumped away from pumping zone.
3. Cuts through tough clay strata, when encountered, to reach underlying richer gravel. No pump can be expected to penetrate clay strata. "Swintek" cutters hog out clay and carry it away from pumping zone.



New Catalog 83 graphically tells the complete "Swintek" story—send for YOUR copy. Form 454 describes Eagle All-Steel "Swintek" Equipped Dredges.

EAGLE IRON WORKS

Leaders in Aggregate Washing and Classifying Equipment for a Half Century



Screw Washers | Log Washers | "Swintek" Dredge Ladders | Breaker Balls and Pile Hammers

Slate of A.G.C. Headed By Heldenfels, Cawdrey—'58 Convention in Dallas

The largest mid-year board meeting in the history of the Associated General Contractors of America was held recently in Seattle, Wash., with more than 500 representatives of construction firms and of the association's 125 chapters and branches attending the sessions.

The group represented the 7,000 A.G.C. member firms who do about 80 percent of the contract construction performed in the United States.

The governing and advisory boards nominated Vice-President Fred W. Heldenfels Jr., Heldenfels Brothers, Corpus Christi, Tex., for 1958 president, and James W. Cawdrey, Cawdrey and Vemo, Seattle, for vice-president. Heldenfels Brothers is a leading southwestern highway construction and aggregates-producing firm, and Cawdrey and Vemo is a widely-known building construction company.

Officers and 27 national directors will be elected by mail ballot in December. Installation will take place at the A.G.C.'s 39th annual convention in Dallas, February 10 to 13, 1958.

Shale-Clay-Slate Institute Holds 5th Annual Meeting

During the week of September 23 the Expanded Shale, Clay and Slate Institute held its fifth annual meeting at the Dinkler-Plaza Hotel, Atlanta, Ga.

The following were elected as officers for the ensuing year: president, Otto Frei, Georgia Lightweight Aggregate Company, Atlanta; first vice-president, W. H. Thomas, McNear Brick Company, San Francisco; second vice-president, Allan P. Taylor, Kenlite, Louisville, Ky.; treasurer, Ben F. Park, Buildex, Inc., Ottawa, Kans.; and secretary, L. A. Thorssen, Consolidated Concrete Products, Ltd., Calgary, Canada.

During the open session J. J. Shideler, manager, Products and Applications Development Section, Portland Cement Association, presented a paper on *Structural Lightweight Concrete*. At this time members also saw the premiere showing of a film entitled *Concrete Facts on Lightweight Aggregate*.

A portion of the audience at the open session. At the speakers' table are (left to right): Carl Rollins, Clinton Jones, Otto Frei (president), Jack McDargh, J. J. Shideler, George Nelson, and L. A. Thorssen (secretary).

● Answer the Christmas Seal appeal by using 1957 stamps.

Basic Materials Company Formed from Merger Of Four St. Louis Firms

Plans have been announced for the consolidation of a sand and gravel firm, two ready-mix concerns, and a truck-leasing company into a St. Louis (Mo.) corporation, to be known as Basic Materials Co.

Companies to be merged are the Mississippi River Sand and Material Company of St. Louis, a publicly held corporation; Concrete, Inc., and Goltermann Material Company, both privately owned ready-mix companies; and PFC Equipment Company.

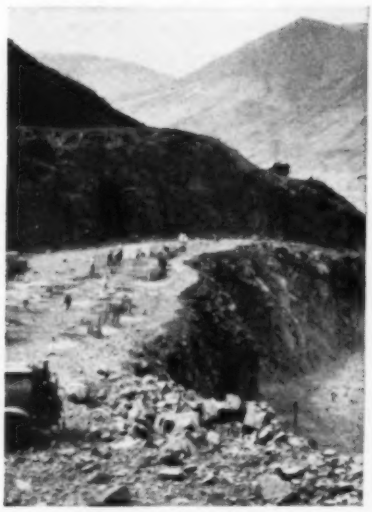
As a part of the plans, the proposed new company would obtain additional ready-mix facilities by purchasing the physical assets of Construction Materials Company and County Concrete, Inc., both of St. Louis. This merger will make Basic Materials the largest building materials and ready-mix company in the area.

Detailed plans have been approved by all the managements concerned. Under the merger plan, Basic Material Company would have an authorized capitalization of $3,500,000, consisting of 100,000 shares of preferred stock with $25 par value and 1,000,000 shares of common stock with $1 par value.

A large building for storage of clinker material is being erected for the Penn-Dixie Cement Corporation near the firm's plant on Lake Shore Road in Buffalo, N. Y. The structure will be about 80 ft. wide and 125 ft. long and will cost approximately $100,000. The new building will not result in a production increase.

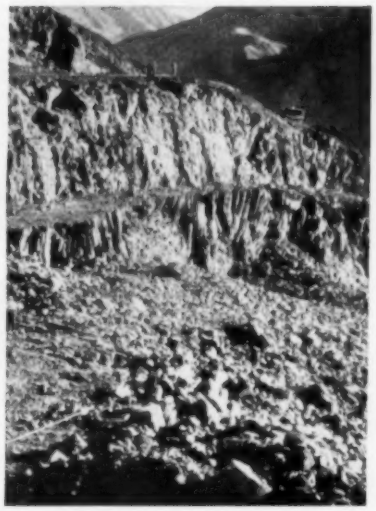
NEW RESULTS OF MONSANTO RESEARCH IN USE OF AMMONIUM NITRATE AS AN EXPLOSIVE

Typical shot with Monsanto's new kind of prilled NH_4NO_3



View of area involved in the blast. Shot was made in heavy columnar basalt at dam site. Used as an explosive: a new, top-quality, prilled NH_4NO_3 that Monsanto research developed to give you optimum savings, safety, speed and ease of handling.

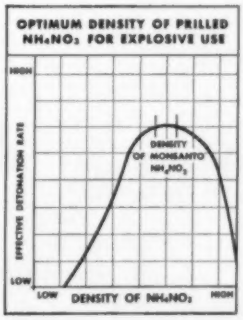
View at time of detonation. The system of detonation recommended by Monsanto, in conjunction with Monsanto Ammonium Nitrate, will yield equivalent pound-for-pound results with 60% gelatin dynamite at one-fourth the cost.

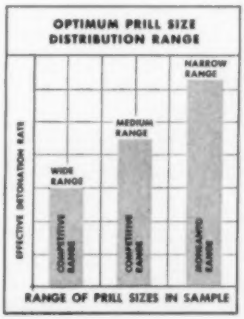


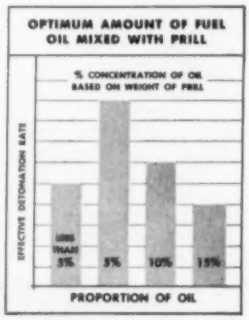
Results of blast. The powder factor in the shot above was 0.4 lbs. per cubic yard. Breakage of rock was considered ideal by contractor. Monsanto's experienced staff can give you complete technical service. Just phone Monsanto.

Photos courtesy of MORRISON-KNUDSEN COMPANY, INC.

Monsanto Ammonium Nitrate is now produced according to the specifications determined by these findings of Monsanto research. Result: more effective blast at greater savings. Monsanto is the world's largest manufacturer of prilled ammonium nitrate—and leader in developing the use of NH_4NO_3 as an explosive for open work. Request report presenting latest research findings.







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Queen of the big shovels

55-CU.-YD. DIPPER makes a bulldozer look small. The Tiger Brand Wire Rope is 2⅝" in diameter.

THE RIVER QUEEN, largest shovel ever built by Bucyrus Erie. Now operating in the River Queen mine near Central City, Kentucky. The mine is owned jointly by W. G. Duncan Coal Co. and Peabody Coal Co. It is operated by Peabody.

can move 100,000 tons daily

with "muscles" of Tiger Brand Wire Rope

IN LESS THAN A MINUTE, the River Queen can scoop up an 80-ton bite of rock and earth, pile it 295 feet away and be ready for the next bite. That's fast digging!

The River Queen is the largest power shovel that Bucyrus Erie has ever built. It has a 55-cubic-yard dipper and is as high as a 13-story building.

The wire ropes that harness the tremendous power of the shovel are all U.S.S. American Tiger Brand. The two twin-reeved hoist ropes are 2⅝"-diameter, 6 x 49 Lang Lay Monitor Excellay with Independent Wire Rope Core. The two twin-reeved crowd ropes and the single twin-reeved backhaul rope are of the same size and construction.

The boom supports are eight in number for a total length of approximately 952 feet. These are 2½" Galvanized Boom Support Strands of special design for long service life.

The fact that all the wire rope applications on this huge shovel are handled by standard Tiger Brand constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope.

THE BIG BOOM is 145 feet long and is supported by eight 2½" Tiger Brand Boom Supports. Note also the two twin-reeved hoist ropes in foreground.

AMERICAN STEEL & WIRE DIVISION
United States Steel, General Offices: Cleveland, Ohio

The right wire rope will do the trick!

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
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USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

The Texas Aggregates Association's Safety committee members include, left to right, Ray L. Cain, executive secretary, Texas Aggregates Association; E. C. McFaddin, director, National Safety Council; W. M. Saunders, safety engineer, Gifford-Hill & Co., Inc.; Shelley Burt, vice-president-production manager, Servtex Materials Co.; Allan F. Cunningham, F. M. Reeves & Sons, Inc., president of the association; and Ramsey G. DiLibero, district engineer, Texas Employers' Insurance Association.

Lime Sales Show Decrease In June, 6-Month Period

Domestic sales of open-market lime in June (721,872 short tons) decreased compared to the previous month's output, according to reports by producers to the U. S. Bureau of Mines. Building lime increased, whereas decreases were noted in agricultural, chemical, and refractory uses.

The accompanying table shows sales of lime by types and major uses.

United States Gypsum Plans Big Plant at Texas Site

Plans for the construction of a multimillion-dollar gypsum plant near Houston, Tex., were approved by directors of United States Gypsum Company, Chicago, Ill.

The proposed plant will service the Texas Gulf coast area with gypsum wallboard, rock lath, plaster, and gypsum sheathing. This facility should provide enough building materials to finish the walls and ceilings of 40,000 homes annually.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1956-57, by Types and Major Uses, in Short Tons

	May	June		January-June	
	1957	1957	1956	1957	1956
By types:					
Quicklime	618,561	560,424	533,017	3,604,539	3,700,015
Hydrated lime	169,827	161,448	173,763	915,678	973,818
Total lime[2]	788,388	721,872	706,780	4,520,217	4,673,833
By uses:					
Agricultural:					
Quicklime	8,441	3,750	15,878	28,293	48,068
Hydrated lime	18,676	11,149	11,909	87,942	92,301
Total lime	27,117	14,899	27,787	116,235	140,369
Building:					
Quicklime	21,758	26,247	13,669	95,799	80,571
Hydrated lime	82,450	82,706	96,521	435,617	490,233
Total lime	104,208	108,953	110,190	531,416	570,804
Chemical and other Industrial:					
Quicklime	392,353	351,803	367,693	2,304,738	2,354,636
Hydrated lime	68,701	67,593	65,333	392,119	391,284
Total lime	461,054	419,396	433,026	2,696,857	2,745,920
Refractory (dead-burned dolomite)	196,009	178,624	135,777	1,175,709	1,216,740

[1] Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2] Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

Texas Aggregates Assn. Meets to Inaugurate Official Safety Program

The Texas Aggregates Association, composed of commercial producers of sand, gravel and crushed stone, inaugurated an official safety program for the industry when its safety committee met at the association's headquarters in Austin, Tex.

Members of the safety committee are: Shelley Burt, vice-president-production manager, Servtex Materials Co., New Braunfels; John H. White, president, White's Uvalde Mines, San Antonio; and W. M. Saunders, safety engineer, Gifford-Hill & Co., Inc., Dallas.

Assisting in the organization was Allan F. Cunningham, F. M. Reeves & Son, Inc., Odessa, president of the T.A.A.; E. C. McFaddin, director, National Safety Council, Dallas; Ramsey G. DiLibero, district engineer, Texas Employers Insurance Association, Austin, and Ray L. Cain, executive secretary of the T.A.A.

The purpose of the program is to help reduce accidents and loss of working time, to analyze reports, and to ascertain the major accident causes and types for the benefit of the members.

Mississippi Firm's Plant To Pioneer in Light Aggregate

According to an announcement released by W. H. Day, president of Jackson Ready-Mix Concrete, Jackson, Miss., his company's newest plant, now under construction, will be in operation by January, 1958. It will be the first lightweight aggregate producing plant in Mississippi.

This new industry, which will involve mining and processing raw materials into lightweight aggregate, is located on a 675-acre tract, about 6 miles north of Jackson, bordering on the Illinois Central Railroad's right of way.

Last March Mr. Day announced a multimillion-dollar expansion program for Jackson Ready-Mix Concrete. This firm, the only one producing prestressed concrete in Mississippi, has launched a project involving the construction of prestressed concrete plants in six cities of that state.

Consumption of cement in France in 1956 was estimated at 10,400,000 tons, compared with 9,700,000 tons in 1955. Imports of lime and hydraulic cement totaled 30,000 tons in 1956 and 15,000 tons in 1955.

Eaton 2-Speed Axles keep trucks YOUNG!

Add Extra Thousands of Low-Cost, Trouble-Free Miles

Drivers of Eaton 2-Speed Axle trucks select from *double* the conventional number of gear ratios—pick the gear ratio best suited to road, load, and traffic conditions. Using the RIGHT gear ratio for every condition permits engines to run in their most efficient and economical speed range—reduces stress and wear on engine, transmission, and the axle itself. This reduction in stress and wear keeps trucks on the job and out of the shop, cuts operating and maintenance costs, and adds thousands of miles of low-cost operation to the life of the truck. Whenever a hauling job requires the combination of pulling power and speed, trucks equipped with Eaton 2-Speed Axles do the job quicker at lower cost; they stay YOUNG longer—and are worth more when traded in.

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Lucas E. Pfeiffenberger Named Technical Director For Clay Shale Association

Appointment of a full-time technical director was authorized by producer-directors of the Expanded Clay and Shale Association at its mid-year meeting in Knoxville, Tenn.

Lucas E. Pfeiffenberger, Urbana, Ill., a ceramic engineer, was named

L. E. Pfeiffenberger

to the technical director's post. Mr. Pfeiffenberger, who was formerly associated with Alton Brick Company, assumed his duties on October 1. He has been doing graduate research at the University of Illinois.

An intensive E.C.S.A. test and research program will be supervised by Mr. Pfeiffenberger. The goal will be the development of additional information about the properties of expanded clay and shale aggregates.

Shalite Corporation of Knoxville, was host at the Knoxville meeting. A tour of the Shalite plant was conducted, with Ben Batson and D. M. Groves, officers of Shalite, in charge.

R. A. Utiger, president of the association, announced the appointment of B. K. Powers, Virginia Lightweight Aggregate Corporation, Roanoke, as chairman of a committee that will study plant operating methods and report to the annual meeting in Chicago this coming January.

The Technical Problems Committee, headed by Mel Cruzen, Light Weight Aggregate Corporation, Livonia, Mich., offered a comprehensive report which included a recommendation to commit the association to a full-scale research program.

The producers' meeting and an evening dinner meeting were held at the Hotel Andrew Johnson. On the following day the sessions were moved to scenic Gatlinburg, Tenn., gateway to the Great Smokies. During the open meeting Ray Schutz, technical director of the Sika Chemical Company, Passaic, N. J., presented a paper on the *Influence of Temperature on Quality Control of Concrete.*

The Hanson-Moody Engineering Service of Bristol, Va., was admitted to associate membership. D. M. Groves, secretary-treasurer, reported on the association's finances.

Denver, Colo., was chosen as the site of the association's mid-year meeting in June, 1958. Plans for this session will be developed at the annual meeting, to be held in Chicago in January, 1958, in conjunction with the National Concrete Masonry Association convention.

Missouri Limestone Producers Names R. Kalberloh Manager

Ralph J. Kalberloh, formerly executive vice-president of the Missouri State Junior Chamber of Commerce, assumed the duties of manager of the Missouri Limestone Producers Association, Jefferson City, Mo., on September 1, 1957. He had been first executive vice-president of the Missouri Jaycees since March 1, 1955.

Mr. Kalberloh succeeded Paul N. Doll, who resigned to devote full time to his duties as executive director of the Missouri Society of Professional Engineers and as editor of the Society's monthly magazine *Missouri Engineer.* For the remainder of the year, Mr. Doll will continue to serve the board of the Limestone Producers Association as a consultant.

Ralph Kalberloh

Three Cement Companies Approve Plans to Merge By End of December '57

Garner A. Beckett, president of the Riverside Cement Company, San Francisco, Calif., announced that negotiations are under way for a merger of the Riverside Cement Company, the Hercules Cement Corporation, Philadelphia, Pa., and the Peerless Cement Corporation, Detroit, Mich., and that the boards of directors of the three corporations have approved the merger in principle.

While some details are still to be worked out, Mr. Beckett indicated that discussions are proceeding satisfactorily and that it is hoped the merger agreement can be submitted to the stockholders of the three corporations in sufficient time to permit completion of the merger in December.

Riverside Cement markets cement principally in southern California, southern Nevada, and Arizona. Hercules Cement Corporation, with its office in Philadelphia, sells chiefly in the northeastern portion of the United States; Peerless Cement Corporation sells principally in Michigan, Indiana, and Ohio. The total annual capacity of the merged company will be approximately 18,500,000 bbl., making it one of the largest cement firms in the country.

Under the present plans, the combined company would have a new name, and its initial officers would include Mr. Beckett as chairman of the board, W. C. Russell, president of Peerless, as vice-chairman of the board and chairman of the executive committee, and D. S. MacBride, president of Hercules, as president.

Mr. Beckett emphasized the firm intention to operate the properties and businesses now owned by the three corporations as autonomous divisions of the combined company, with the continuation of present brands and product names.

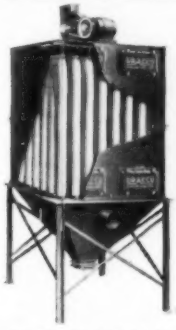
Pittsburgh Plate Glass Co. Transfers Cement Division

The Pittsburgh Plate Glass Company, Pittsburgh, Pa., has transferred the facilities of its Columbia Cement Division at Zanesville, Ohio, to the Columbia-Southern Chemical Corporation, Pittsburgh, Pa., a wholly-owned subsidiary of Pittsburgh Plate Glass.

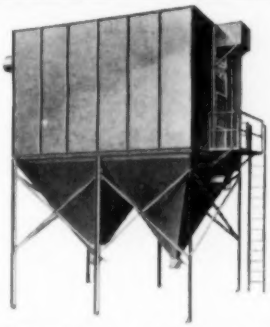
The present management and sales organization of the cement division will become a part of the Columbia-Southern Chemical Corporation. There will be no change in sales policies.

there is a Dracco unit

Whirl-Clones answer the need for efficient cyclone-type collection. Widely used with high temperatures, corrosive materials or large particle sizes. Dracco design assures efficient separation in units to 8-foot diameter. Welded construction assures minimum wear and long life.



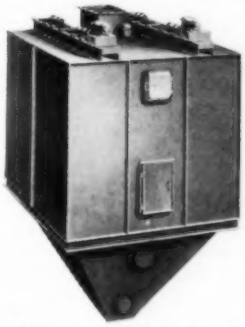
Uni-Filters can be located at dust sources for efficient control with lower piping and power costs. Compact self-contained units with capacities from 300 to 1800 cfm require little space, are shipped ready to install and can be easily relocated.



Multi-Bag Filters, basic Dracco unit, combine moderate cost with multi-duty versatility. Compact, space-saving housing can be installed inside or outside, contains unusually large cloth area. Models for intermittent or automatic, continuous service in wide size range with unsurpassed efficiencies.

to solve almost every

Dustomatic Filters are designed for continuous dust and fume recovery under heavy-duty conditions such as non-stop operation, high temperatures, heavy dust loads and high static pressures. Often used as integral part of chemical and metallurgical process equipment.



"DH" Filters are probably the finest units for automatic dust collection under severe conditions. Extremely rugged, they collect heavy, dense or sticky dusts that cannot be handled any other way. Well worth their extra cost because of their high capacity-to-size ratio.

"X" Filters, soon to be announced, will provide the long-sought answer to high-efficiency collection of hot or corrosive dusts and fumes. These advanced-design units are now being extensively field tested at temperatures to 600°F.

dust or fume problem

This extensive equipment line plus Dracco's 40-year reputation for solving the toughest dust problems are sound reasons for talking to Dracco first.

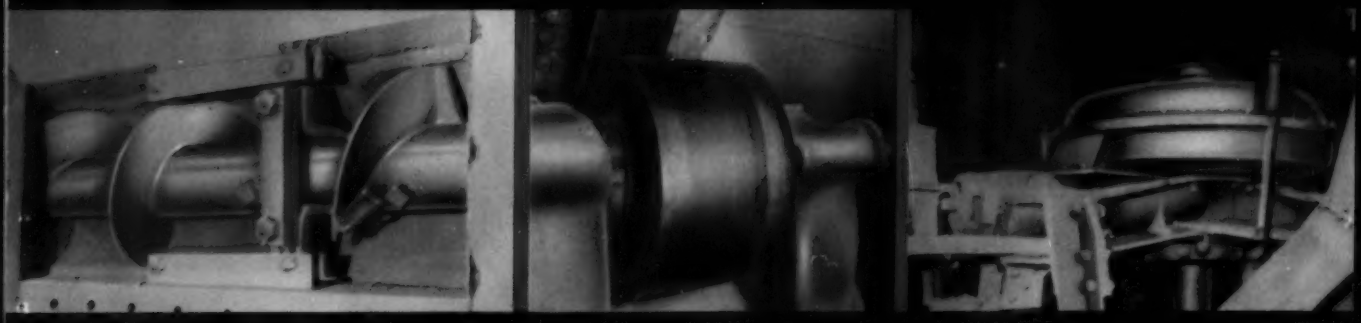
DRACCO CORPORATION • 4050 East 116th Street • Cleveland 5, Ohio

Complete 40-page catalog on Dracco Dust Control Equipment contains detailed data and valuable reference material. Write for Bulletin 800.

DRACCO *airstream* conveyors
dust control equipment

A SUBSIDIARY OF FULLER COMPANY GENERAL AMERICA

ask MARQUETTE



about TSP hardened products

They'll tell you "Tool Steel Process" Hardened Products operating efficiently at key points in pulverizers, kilns, dryers, cranes, shovels, mixers, drag lines, etc., is a sure way to enjoy trouble-free operation. That's why, throughout Marquette Cement Company's many plants, TSP Hardened Gears, Pinions, Wheels, Axles, Drums, Shafts, Trunnion Rolls, Gudgeons, etc., have been delivring outstanding performance for over forty years.

TSP Hardened Products are specifically designed, produced and guaranteed to out-perform, out-last any competitive product. A special hardening process achieves a file hard surface to the full depth of permissible wear. The core is refined for toughness and ductility. If you're interested in keeping your equipment running better and longer, write today for fully illustrated free brochure — "TSP Products for the Cement Industry."

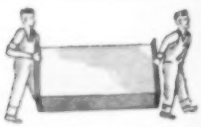
THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U. S. A.

Assembly is simple

with bucket elevators LINK-BELT-built from head to boot

CHAINS, SPROCKETS, PULLEYS — a type and size to handle all kinds of material, satisfy any application requirement.

BEARINGS — We make all types — babbitted, bronze, ball and roller — to meet your specific service conditions.



CASINGS—are furnished weather- or dust-tight. They are self-supporting—where conditions warrant, lateral tie-in can be supplied.

ENCLOSED GEAR DRIVES — Gearmotors, Motogears, Worm Gear Drives — in sizes and ratios to meet any requirement.

BUCKETS—All types and sizes suitable for handling a variety of materials are available from stock.

TAKEUPS—A type suitable for adjusting elevator chain or belt to proper tension — babbitted, bronze, ball and roller bearing types.

All components are designed and manufactured for quick installation, smooth performance

HERE'S a point worth considering when you review prices on bucket elevators. Installation costs have a big effect on the total outlay. And your best bet for holding field erection costs to a minimum is by relying on Link-Belt.

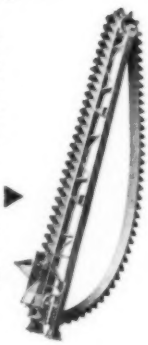
Reasons are: first, Link-Belt *manufactures all bucket elevator components*—your assurance that designs are related. Secondly, it's easy to select the proper bucket elevator to meet your specific requirements from Link-Belt's complete line. And third, with each Link-Belt bucket elevator you get built-in alignment.

In addition, Link-Belt will erect your elevator and accept full installation responsibility. For more details and assistance in selecting a suitable bucket elevator for your operation, call your nearby Link-Belt office today. 14.717

Designed for maximum elevating efficiency . . .

◀ **WIDE RANGE OF MATERIALS** — from light to heavy, fines to large lumps—are handled by continuous discharge elevators. Fixed or adjustable head shaft.

SAND, GRAVEL, STONE and other abrasive materials are carried by inclined elevators. Chain or belt types available with or without casings. ▶



LINK-BELT

BUCKET ELEVATORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

Final Annual '56 Cement Report Issued by U.S. Bureau of Mines

IN 1956 the cement industry in the United States produced four classes of cements—portland, natural, slag, and hydraulic lime—and prepared masonry cements, as reported to the U. S. Bureau of Mines.

PRODUCTION — Production of portland cement was 6 percent greater in 1956 than in 1955, reaching a high of 316,000,000 bbl.

Production of prepared masonry cement remained at 16,000,000 bbl. in 1956 as in 1955.

Production of natural, slag, and hydraulic lime cements increased 20 percent in 1956, as compared to 1955.

SHIPMENTS—Shipments of portland cement rose to 308,000,000 bbl., valued at $940,000,000, with an average value of $3.05 per barrel.

Shipments of prepared masonry cements decreased to 15,000,000 bbl., valued at $59,000,000, with an average value of $3.75 per barrel.

Shipments of natural, slag, and hydraulic lime cements rose to 1,000,000 bbl., valued at $3,500,000, with an average value of $3.34 per barrel.

APPARENT CONSUMPTION — Comparative figures on apparent consumption can only be shown for portland cement. Based on the quantities of portland cement shipped by producers to destinations in the various states, consumption was higher in 33 states and lower in 15 states and the District of Columbia.

CAPACITY—The estimated annual capacity of the portland cement plants on December 31, 1956, was 11 percent higher than at the end of 1955. The percentage of capacity utilized was lower in all districts except 7.

FUEL—The quantities of coal and natural gas increased in 1956, compared with 1955; coal 6 percent, and natural gas 10 percent.

TYPES OF PORTLAND CEMENT —The classification of portland pozzolan included three plants producing a true portland-pozzolan cement using pozzolanic materials and six plants using blast-furnace slag to make portland-slag cement (A.S.T.M. definitions).

NATURAL, SLAG, AND HYDRAULIC LIME CEMENTS — Natural cement was produced by three plants, slag cement (formerly referred to in these reports as pozzolan cement) by two plants, and hydraulic lime by one plant. Four of these six plants and another natural cement plant produced prepared masonry cement in 1956. Production and shipments of these prepared masonry cements were combined with the prepared masonry produced at portland-cement plants.

The Atlas Rock Crushing Company has begun operations in Pryor, Okla. Initial capacity will be approximately 150 t.p.h. S. J. Wick is the operator and manager.

Bill N. Southworth

Southworth Named Assistant To N.C.S.A.'s Director Boyd

The newly appointed assistant to the director of the National Crushed Stone Association in Washington, D. C., is Bill N. Southworth, who succeeds R. M. Pruitt, resigned.

As assistant to J. R. Boyd, N.C.S.A.'s executive director, Mr. Southworth has the advantage of broad experience in association affairs, since he has been working on public relations, news writing, conventions, organization and committee activities.

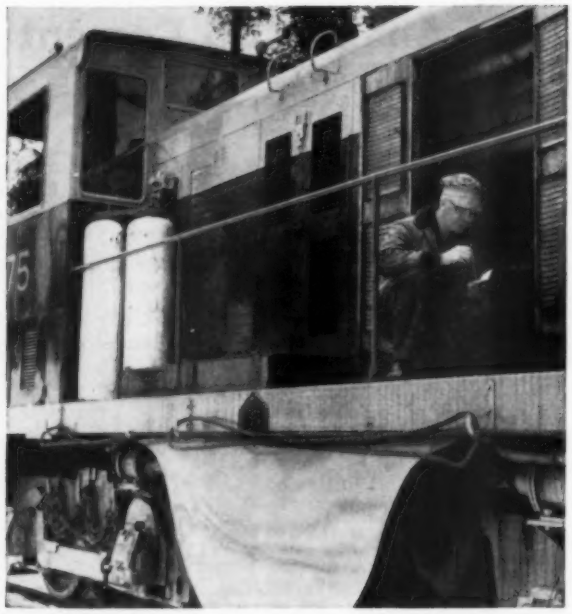
The Livingston Rock & Gravel Company will build a new batch plant, its fifth, in Gardena, Calif.

Salient Statistics of the Cement Industry in the United States, 1947-51 (average) and 1952-56[1] (1,000 bbl.)

	1947-51 (av.)	1952	1953	1954	1955	1956
Production:						
Portland—bbl.	214,749	249,256	264,181	272,353	297,453	316,438
Prepared masonry—bbl.					16,519	15,906
Natural, slag, and hydraulic lime—bbl.	[3]3,454	[3]3,402	[3]3,488	[3]3,504	941	1,128
Total—bbl.	218,203	252,658	267,669	275,857	314,913	333,472
Capacity used at portland-cement mills—percent	81.8	87.8	90.5	91.4	94.3	90.6
Shipment from mills:						
Portland—bbl.	213,357	251,369	260,879	274,872	292,765	308,678
Prepared masonry—bbl.					16,526	15,898
Natural, slag, and hydraulic lime—bbl.	[3]3,446	[3]3,447	[3]3,459	[3]3,513	954	1,074
Total—bbl.	216,803	254,816	264,338	278,385	310,245	325,650
Value of shipments[4]	$ 493,106	$ 648,264	$ 707,604	$ 773,076	$ 896,888	$1,003,298
Average value per barrel	$2.27	$2.54	$2.68	$2.78	$2.89	$3.08
Stocks at mills, Dec. 31—bbl.	13,583	16,046	19,414	16,612	[5]17,604	22,534
Imports—bbl.	546	476	386	450	5,220	4,456
Exports—bbl.	4,521	3,174	2,551	1,859	1,795	1,973
Apparent consumption[6]	212,828	252,117	262,173	276,977	313,669	328,133
World production (estimated)—bbl.	688,750	[5]945,100	[5]1,050,900	[5]1,142,000	[5]1,275,100	1,379,900

[1] Includes Puerto Rico.
[2] Not included in tabulation until 1955.
[3] Includes masonry cement from natural, slag, and hydraulic lime cement plants.
[4] Value received f.o.b. mill, excluding cost of containers.
[5] Revised figure.
[6] Shipments from domestic mills minus exports.

A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of *A*lkalinity, *D*ispersancy and *C*ontamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

A Kansas City Freight Line

Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-

Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.

Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased many-fold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.

Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.

One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

*Indicator Fluid U.S. Patent No. 2,770,530

SHELL OIL COMPANY

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100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Pittsburgh Coal Concern Enters Limestone Field With New Plant in Ohio

Pittsburgh Consolidation Coal Company has entered the limestone field with the completion of its aggregate plant near Carrollton, Ohio. The business is operated in conjunction with the firm's Hanna Coal Company Division at Georgetown, Ohio. This division required aggregate for topping its own roadways, used by trucks weighing up to 100 tons.

To supply its needs, the firm bought a deposit of high-grade limestone with reserves estimated at several million tons and built a plant with a production output of 400 t.p.h. Its annual capacity is rated at 650,000 tons.

Products of the new plant range from agricultural limestone to 7- and 8-in. aggregates. Recently a contract was received for 400,000 tons of aggregate for use in the New Cumberland dam now being built near Stratton, Ohio.

The cumulative total for highway construction for 1957, $2,261,600, is running 30 percent ahead of 1956.

ARE YOUR STONE AND GRAVEL PRODUCTS CUBICAL IN SHAPE?

ARE THEY FREE OF SOFT STONE AND CLAY?

WILL THEY MEET SPECIFICATIONS AND PASS ABRASION TESTS?

DO YOU NEED MORE OF THE FINER SIZES IN YOUR SAND PRODUCTS?

CAN YOU MEET TODAY'S SPECIFICATIONS ON AG LIME?

STEDMAN CRUSHING EQUIPMENT

SOLVES MOST OF THESE PROBLEMS!

Write for complete details on the STEDMAN PRINCIPLE OF IMPACT CRUSHING to meet today's requirements.

MORE THAN A CENTURY OF KNOW-HOW

STEDMAN FOUNDRY AND MACHINE COMPANY, INC.

Subsidiary of United Engineering and Foundry Company

AURORA, INDIANA Founded 1834

Prestridge New President Of Union Gypsum Co.— Hazelton Named Manager

M. R. Prestridge, New Mexico and west Texas businessman, has succeeded Henry C. McQuatters as president of Union Gypsum Company of Phoenix, Ariz.

Serving under Mr. Prestridge as

Kirk Hazelton

general manager is Kirk Hazelton, formerly associated with United States Gypsum, National Gypsum, Certain-teed, Cleveland Gypsum, and Great Lakes Carbon companies. Mr. Hazelton's assistants in production will be Leo Hakes, plant manager, and Archie Lee, quarry superintendent.

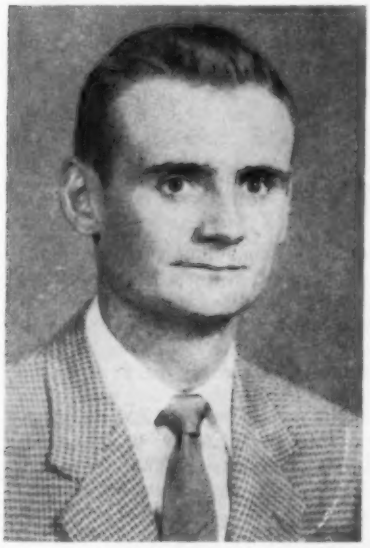
Other new officers of the firm are Carlton M. Rogers, vice-president; Ray L. Moore, secretary-treasurer; and R. G. Shorthouse Jr., assistant secretary-treasurer.

Cris Dobbins, president of the Ideal Cement Company has announced that a contract for preparatory work on the site of a new plant at Tijeras, N.M., has been awarded. McKenzie Construction Company, San Antonio, Tex., will grade the site, terrace it, and build roads for the proposed $12,000,000 plant.

Marble Cliff Quarries Company, Columbus, Ohio, has established a professorship in the department of engineering of Ohio State University. Under this $5,000 grant, a faculty member will share his time between teaching and research on natural aggregates in construction.

Joyce Named Sales Mgr. For Buildex, Incorporated At Newly Acquired Plant

William M. Joyce, who was formerly sales engineer for Buildex, Inc., at Ottawa, Kans., has been named sales manager and transferred to the firm's operation at New Lexington, Ohio. The purchase of Lite Stone Aggregate Corp. of New Lexington was announced recently by George K. Mackie Jr., president of Buildex. The addition of Lite Stone's facilities increases the production capacity of Buildex to approximately 300,000 cu. yd. of aggregate annually.



W. M. Joyce

Other officers of Buildex include Cecil W. Kincaid, vice-president, production; Ben F. Park, vice-president, sales; and John W. Mackie Jr., secretary-treasurer.

Buildex started the production of lightweight expanded-shale aggregate (Haydite) in its Ottawa plant in March, 1952, using two of the largest kilns (8 by 125 ft.) in this industry. The New Lexington plant is of similar design.

$60,000,000 Potash Industry Under Way in Saskatchewan

A $60,000,000 potash industry is under way in Saskatchewan, Canada, with 18 companies sinking shafts or starting exploratory work prior to building shafts.

These 18 companies have leased 4,000,000 acres in a strip 15 miles wide and 340 miles long in the central part of the province. Three are now engaged in shaft sinking.

Potash Company of America, Carlsbad, N. M., has a shaft already at the halfway mark to mineral beds lying at 3,000 ft. P.C.A.'s shaft is on 200,000 acres of land under lease at Patience Lake.

Recoverable potash reserves in the field are estimated at 100,000,000,000 tons, or nearly double the known U. S. reserves centralized in New Mexico.

CHARLES H. GRISEMER has been promoted to resident manager of the American Bitumuls and Asphalt Company plant in Columbus, Ohio.

Nanyang Cement Co., Ltd. To Build Plant in Malaya

Chinese interests in Ipoh, Malaya, are forming a new company, the Nanyang Cement Company, Ltd., to produce cement in the area. A 25-acre site has been selected for the plant which will have an annual capacity of about 100,000 long tons.

This is the Malayan Federation's second cement plant.

Australian cement production was 2,138,000 tons in 1956. This output was 10 percent over that of 1955.

Endless Economy The Transall® Way

Perfecters of the Prelubricated Idler.

Check These Transall® Advantages:

- **Simplified Selection.** Our representative will assist you in selecting the right combination of sectional belt conveyor components for your operation.
- **Accurate Quotations.** Our representative will prepare a prompt accurate estimate of installation requirements.
- **Less Maintenance Costs.** Idlers prelubricated at factory will pay for themselves in maintenance savings after a short time.
- **Longer Life of Bearings.** Deep-groove, factory-sealed bearings have a minimum life expectancy of more than 100,000 hours.
- **No Metal to Metal Contact**—Thanks to NEOPRENE Seals. These are contact seals operating against polished surfaces.
- **Special Water-Free Lubricant** eliminates corrosion. Perfect operation from minus 90° to plus 250° F.
- **Extra Efficient Frames.** All parts jig-welded into one piece assembly and interchangeable.
- **Durable Rolls.** Heavy cold rolled welded steel. No warping of material to cock bearings.

Translating More Experience Into Greater Economy For You

For complete information write or wire

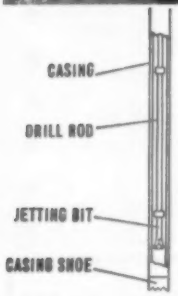
TRANSALL, INC. 109 No. 11th Street • P. O. Box 1588 BIRMINGHAM, ALABAMA

At the Logan Quarry of the Granite Rock Company, Watsonville, Calif., grading operations required an aggregate tunnel with four separate aggregate piles. This illustration shows the tunnel, a 390-ft. length of 96-in. Armco corrugated metal pipe, exposed between the four piles. The height of the piles over the pipe sometimes reaches 25 ft.

What's down there?

Empire
TEST DRILLS
come up with the
RIGHT ANSWERS

EMPIRE
Hydraulic
Testing
Drill



This test-drilling equipment is a "must" for pit and quarry operators and general contractors.
The EMPIRE Junior Drill used manually with solid rods or the EMPIRE Hydraulic Jetting Drill, using hollow rods, is the standard method of exploring sand and gravel deposits for composition and presence of clay, and accurately determines overburden depth and formation.
Easily transported in any kind of terrain. Assembled and ready for work in minimum time with ordinary labor.

Write TODAY for complete details

NEW YORK ENGINEERING CO. 75 WEST STREET NEW YORK 6, N. Y.

Imperial Cement Limited Plans $12,000,000 Plant Near Edmonton, Alta.

Imperial Cement Ltd., plans to begin construction next spring on a $12,000,000 cement plant near Big Lake, about 15 miles northwest of Edmonton, Alta. The corporation has already expended about $200,000 on preliminary research and development for the project, which will have a 1,250,000-bbl. per year capacity when completed early in 1959.

Exploration and leasing rights to 5,000 acres of marl deposits, located near the site of the proposed plant, have been acquired by Imperial. Tests have revealed that more than 17,000,000 tons of marl are available from the deposits, enough to last for 50 years.

Gas, railway, and power sources will be convenient to the new plant. A 2½-mile C.N.R. spur line will connect the plant to the main railway at Acheson, and a 3-mile pipeline, with branches ranging from 6 to 10 in. in diameter, will carry the marl to the plant.

Officers of Imperial Cement Ltd. are George H. Morrow, president; Ronald L. Kirk, vice-president; and Victor A. Sittler, secretary-treasurer.

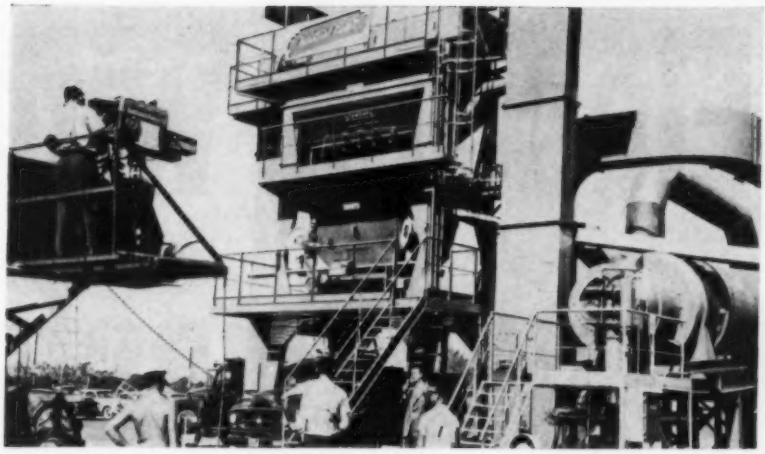
Penn-Dixie Output, Sales Cut by 11-Week Shut-Down

For the nine months ended September 30, 1957, Penn-Dixie Cement sales and earnings amounted to $30,579,522 and $3,427,925, respectively, contrasted with $37,768,830 and $6,513,012 in the 1956 nine-month period. Net profit per share in the 1957 nine-month period totaled $1.23, against $2.45 in the comparable 1956 period.

The nine-month figures reflect the impact of the 11-week strike which closed nine of Penn-Dixie's 10 plants from mid-May to the end of July, B. W. Druckenmiller, president, explained to stockholders in his quarterly report.

George Campbell Sr. of Custer, S. D., has been awarded a contract to operate the federal government's mica buying depot at Custer according to Otto Kline, regional director of the General Services Administration, and Vern Winters, regional director of the Defense Minerals Administration, both of Denver, Colo.

The Stoneway Sand and Gravel Company of Renton, Wash., has opened a store-warehouse branch in Kent, Wash.



Industrial Asphalt's newest 4,000-lb.-capacity plant in Stanton, Calif., starred on "Success Story," a half-hour Los Angeles television program. One of four TV cameras is shown shooting a scene for the show.

New Industrial Asphalt Plant Featured in Popular TV Show

Industrial Asphalt's newest plant at Stanton, Calif., was featured on "Success Story," a half-hour weekly telecast which has established a record for longevity in Los Angeles, Calif., by its 7 years of continuous 52-weeks-a-year production.

The Stanton plant is the company's 26th in southern California. These asphalt plants, all built by Standard Steel Corporation of Los Angeles, include 4,000-, 5,000-, and 6,000-lb. semi-portable units and also the new 2,000-lb. TM trailer-mounted portable unit.

The program traced the growth of the company in 16 years, and the manufacturing process was explained step by step.

Hardy Succeeds Wormser In Dept. of Interior Post

Royce A. Hardy Jr., general manager of Manganese, Inc., Henderson, Nev., was sworn in on October 3 as Assistant Secretary of the Interior for mineral resources, succeeding Felix E. Wormser, who resigned on June 15.

In his new capacity, Mr. Hardy supervises the Bureau of Mines, Geographical Survey, Office of Oil and Gas, Defense Mineral Exploration administration, Office of Minerals Mobilization, and Division of Geography of the Interior Department.

The first major increase in cement output was realized in Pakistan when two new plants, the Zeal Pak and the Maple Leaf, began production.

Production of cement in Guatemala totaled 1,866,832 bags (94 pounds to each bag) in 1956 compared with 9,900,000 bags in 1955.

The government of India has approved the building of a cement machinery manufacturing plant at Durgapur or Mahagaon in Madhya Pradesh by the Associated Cement Company in collaboration with the British firm of Vickers and Babcock and Wilcox. The plant reportedly will be designed to manufacture general mining machinery.

Here is what you get when you use the improved KENNAMETAL* STYLE PX Rock Bits

Kennametal Style PX Rock Bits are available in sizes from 2½" to 5" diameter.

Improved "X" design eliminates rifling, provides greater chip clearance and promotes faster penetration. Alternate long and short carbide insert design puts the carbide where it is needed most, and also speeds penetration. Two off center water ports improve the removal of cuttings.

Longer bit life in service is provided by three new design features: First, these bits generally have more carbide than other bits of equal size. Second, the long inserts are segmented for greater strength. Third, all inserts are of special grades of carbide that were developed specifically for percussion drilling.

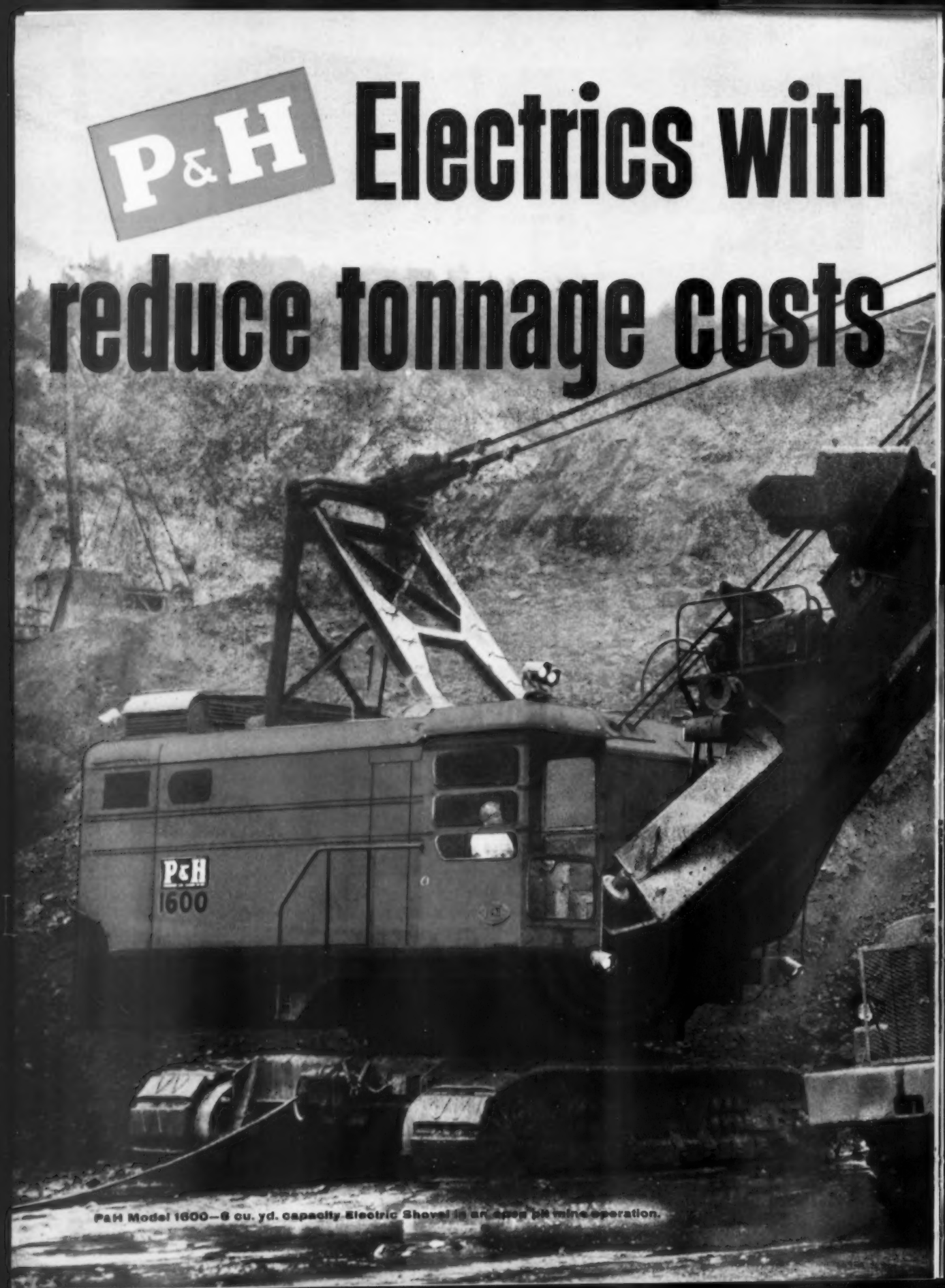
This new design eliminates the center spacer, a common source of trouble in drilling operations.

Investigate these bits for your drilling problems. A Kennametal representative will help you select the size and grade of Kennametal Rock Bits for each of your operations. Call him or write KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

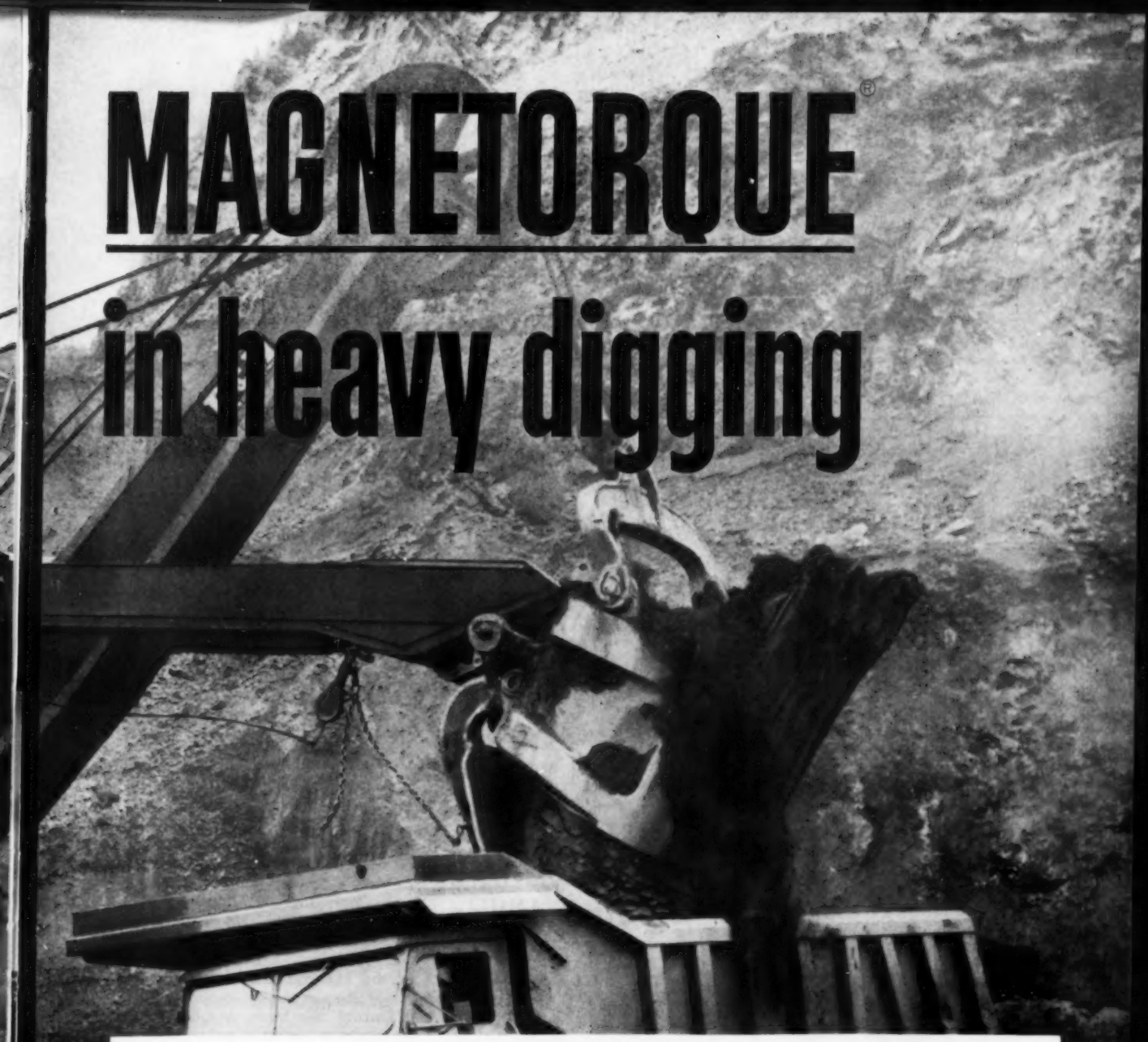
*Trademark

C-30488

INDUSTRY AND KENNAMETAL ...Partners in Progress


P&H
Electrics with
reduce tonnage costs
P&H
1600
P&H Model 1600—6 cu. yd. capacity Electric Shovel is an open pit mine operation.

MAGNETORQUE®
in heavy digging



Exclusive P&H MAGNETORQUE® hoist drive puts more power into the bank when you need it, working smoothly, steadily and efficiently under progressively tougher digging.

MAGNETORQUE transmits power from the shovel hoist motor to the dipper magnetically for faster action and at the same time, eliminates shock and impact to the hoist gear train and motor. Response is immediate to varying load conditions.

ELECTRONIC CONTROLS, exclusively designed and built by P&H, provide fastest action of any type of control known. All shovel motions are smoother, resulting in consistently higher output.

With MAGNETORQUE, P&H ELECTRONIC CONTROLS and P&H scientific weight distribution you get higher line pull per cu. yd. of dipper capacity resulting in increased dipper fill factor . . . more production at lower cost.

P&H designs, manufactures and applies all electrical equipment specifically for electric shovel service.

P&H Electric Shovel Line:
3½ through 8 cu. yd. capacities

HARNISCHFEGER
CONSTRUCTION & MINING DIVISION
Milwaukee 46, Wisconsin

Huron Portland Cement Co. Adds Five Storage Bins In Triple-Play Transaction

At the Cleveland, Ohio, plant of the Huron Portland Cement Company five new cement bins, each 119 ft. high and 34 ft. in diameter, have more than doubled the capacity of this facility.

By working around the clock and using electric jacks to raise the forms, the crew was able to complete the project in 10 days. A team of 50 men worked each 8-hour shift under two superintendents, each of whom worked 12-hour shifts. The walls of the bins went up at the rate of 15 ft. a day.

Huron's own cement was used—naturally—but the procedure was somewhat unusual. It went this way: Huron-made cement was sold to the Cleveland Builders Supply Company, which moved it back to the plant in the form of ready-mix for the general contractor, the McCord Co. of Upper Sandusky, Ohio.

Concrete Materials and Construction Company of Cedar Rapids, Iowa, has begun operations at a branch, the Manhattan Quarry, at Manhattan, Kans.

NOW the National Rock Bit has been added to the HAWTHORNE "Blue Demon" LINE!

for ALL soft-medium-hard formation drilling

The National Cone-Type Rock Bit . . . for Oil and Minerals Exploration and Quarry Blast Hole drilling . . . has been added to the Hawthorne "Blue Demon" *All-Formation* drill bit line.

All assets of National Oil Tool Company, Inc., have been acquired . . . and National Rock Bits are now available from Hawthorne dealers in 3⅞", 4¼", 4½", 4¾" and 5⅝" sizes.

Consistently priced, wherever you go, ask for Hawthorne Bits for all your drilling requirements.

WRITE FOR ILLUSTRATED CATALOG

HERB J. HAWTHORNE INC.

P. O. Box 7366 • Houston 8, Texas • Cable Address: HAWBIT

7478

Erle Palmer Halliburton Of Oil Well Cementing Co. Succumbs After Surgery

Erle Palmer Halliburton, 65, founder of the Halliburton Oil Well Cementing Company, died in Los Angeles, Calif., on October 13. He had been critically ill for several days after undergoing major surgery. Due to ill health, he had not been actively in the business for the last three years.

Erle P. Halliburton

Mr. Halliburton founded the company in 1921. Three years later he incorporated the business with 56 employees. At present the firm employs approximately 9,000 persons in plants throughout the world. The Halliburton Portland Cement Company (Corpus Christi, Tex.) is one of the various ramifications of the Halliburton interests.

During his business career Mr. Halliburton operated gold mines in Central America and in Arizona. He also founded an air line, which he subsequently sold to American Airlines.

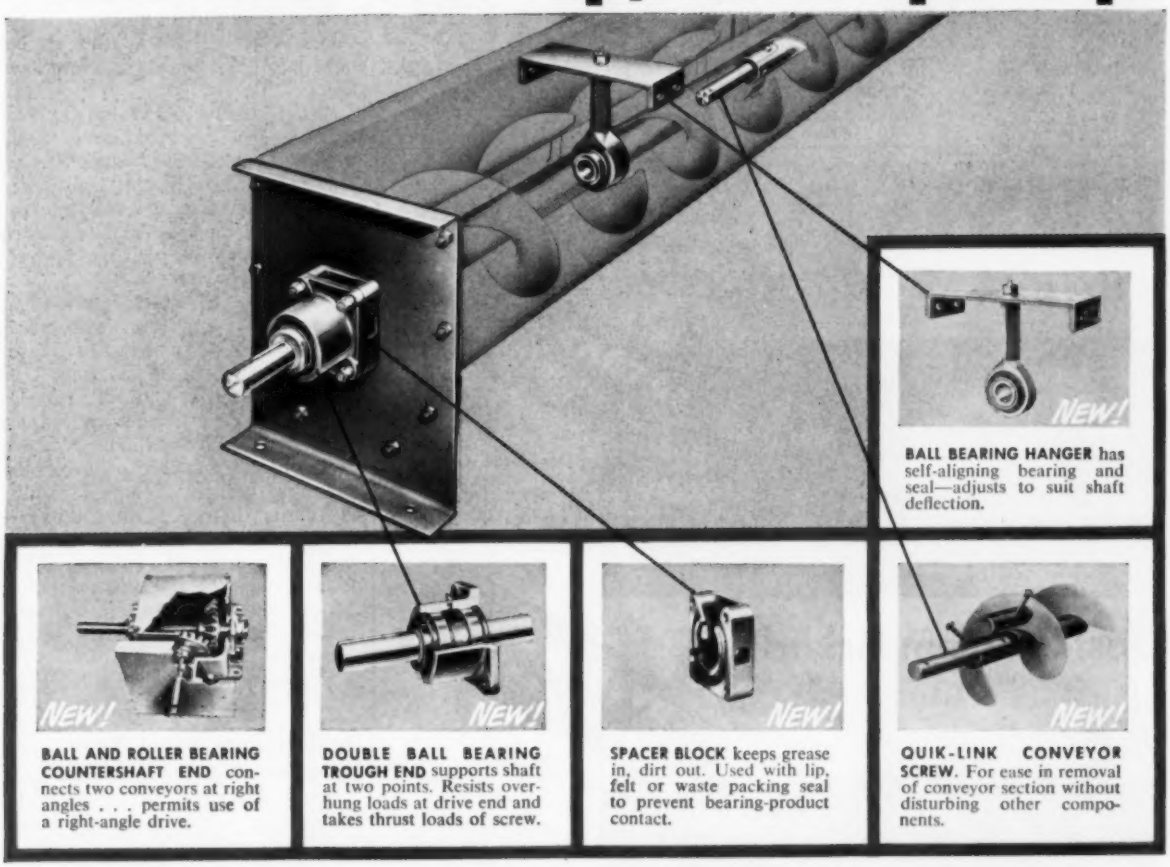
Mineral Resources of Maine Shown in New Publication

The Department of Economic Development has released a new publication, prepared by its Maine Geological Survey Division, which is designed to facilitate locating mineral occurrences in the state.

This publication is the first of a Mineral Resources Reference Map series and is referred to as the *Bangor Sheet, Mineral Resources of Maine.* It is available from the State Geologist upon prepayment of 25 cents to cover cost of printing, handling, etc.

Why screw conveyors with

NEW LINK-BELT components demand less hp, less upkeep



BALL BEARING HANGER has self-aligning bearing and seal—adjusts to suit shaft deflection.

BALL AND ROLLER BEARING COUNTERSHAFT END connects two conveyors at right angles . . . permits use of a right-angle drive.

DOUBLE BALL BEARING TROUGH END supports shaft at two points. Resists overhung loads at drive end and takes thrust loads of screw.

SPACER BLOCK keeps grease in, dirt out. Used with lip, felt or waste packing seal to prevent bearing-product contact.

QUIK-LINK CONVEYOR SCREW. For ease in removal of conveyor section without disturbing other components.

For new or existing systems... LINK-BELT offers a complete line of accessories—many featuring ball and roller bearings

HERE'S a complete line of screw conveyor components designed to bring you smoother performance —reduce downtime and maintenance. Countershaft ends, as well as new trough ends and hangers, use Link-Belt precision ball and roller bearings to reduce starting and running friction . . . lower power requirements for all types of conditions.

The new trough end spacer block with seals protects bearings — prevents product contamination by grease and other foreign matter. Spacer is rabbeted for perfect alignment with bearings. Another outstanding refinement is the Quik-Link conveyor screw that makes removal of conveyor section possible without disturbing other components.

For facts, call your nearby Link-Belt office or authorized stock-carrying distributor. Or write for a copy of Folder 2489 today.

LINK-BELT

SCREW CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,701

Canadian Plants to Supply Cement for Big Operation Planned at Michigan Site

According to the Canadian press, a new multimillion-dollar cement plant is to be built near Dundee, Mich., by Senned Realties Corporation, a Delaware organization in which the St. Lawrence Cement Company has an interest. (St. Lawrence is controlled by Holderbank Financier S.A., a Swiss cement manufacturing group.)

It is reported that a 2,000-acre site has been acquired by Senned, and that L. E. Winkelhaus of Ann Arbor, Mich., has been retained as a consulting engineer.

St. Lawrence plans to ship a large part of the cement for the construction of the Michigan plant from its plants in Villeneuve, Quebec, and Clarkson, Ontario.

In addition to 1,000,000 tons of cement which will be shipped to the United States from Canada next year, large amounts of limestone will probably be supplied by Canadian plants for a project now under discussion by St. Lawrence and American interests.

DUST *was a problem*

50 TONS of DUST discharged in 24 hrs.

"Headache" for producer of lightweight aggregate.

Dust Problem Licked!

OVER 90% free of effluent dust

Producer and community both happy!

"SEEING IS BELIEVING"—the above before-and-after views amply prove the efficiency of Southern's new wet type dust collector.

We had a "king size" problem in our own plant, making lightweight aggregates for the building trade. Extreme heat plus corrosive and abrasive action caused a 50,000 c.f.m. offensive effluent from six stacks. Naturally our neighbors complained!

We tried a lot of collectors, but all failed to stand up against the combination of heat, acids and corrosion.

Finally we designed and built our own—it has passed every test for effectiveness and durability in controlling atmospheric pollution.

If you have a similar problem, contact us for full information without obligation.

SOUTHERN LIGHTWEIGHT AGGREGATE CORPORATION
Process Engineering Division • Box 9138, Richmond 27, Va.

Louis R. Howson Elected To Succeed M. Lockwood As President of A.S.C.E.

The American Society of Civil Engineers has elected Louis R. Howson, senior partner in the Chicago (Ill.) firm of Alvord, Burdick and Howson, consulting engineers, president for one year.

Mr. Howson, succeeding Mason G. Lockwood of Houston, Tex., was installed October 16 at the annual meeting of the Society in New York City, N. Y.

Other officers are Waldo G. Bowman of New York, editor of *Engineering News-Record*, and Samuel B. Morris of Los Angeles, Calif., consulting engineer and former general manager of the Los Angeles department of water and power, vice-presidents for two years.

The new directors, elected for three years, are Prof. Weston S. Evans, Orono, Me., head of the department of civil engineering, University of Maine; Craig P. Hazelet, Louisville, Ky., partner in Hazelet and Erdal; Donald H. Mattern, Knoxville, Tenn., chief of the project planning branch, Tennessee Valley Authority; John E. Rinne, San Francisco, Calif., engineer with Standard Oil Company of California; Philip C. Rutledge, New York, partner in Moran, Proctor, Mueser and Rutledge; Tilton E. Shelburne, Charlottesville, Va., director of the Virginia council of highway investigation and research.

Basic Incorporated Profits Rise for Jan.-Sept. Period

H. P. Eells, president of Basic Incorporated, Cleveland, Ohio, announced recently that net sales in the first nine months of 1957 amounted to $18,443,218, resulting in a net income of $1,266,412.

Corresponding results in the first nine months of 1956 were $17,184,250 of net sales and $1,077,240 of net income.

Third quarter net sales amounted to $6,101,638, resulting in a net income of $378,658.

Corresponding results in the third quarter of 1956 were $5,036,381 of net sales and $247,661 of net income.

• Correction

We regret that Camp Concrete, Ocala, Fla., was erroneously listed as one of the eight firms acquired by the Vulcan Materials Company, Birmingham, Ala. (October issue, PIT AND QUARRY, page 23).

Industry
NEEDS DEPENDABLE
NOURISHMENT too!
Take a tip from your family's dependence on "nature's most nearly perfect food". Coal is nature's most nearly perfect fuel. It's here in abundance for ages to come, a dependably low-cost and most efficient source of "go power"! It's convenient too —right on Industry's doorstep.
B&O
BITUMINOUS COALS FOR EVERY PURPOSE
Ask our man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400

ANOTHER KENNEDY

Complete Cement Plant . . .

GRESIK CEMENT COMPANY,

KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK 16, N.Y. • FACTORY, DANVILLE, PA.

ACHIEVEMENT

Capacity 5000 barrels per day for Island of Java, Indonesia

Aerial view of Gresik Cement Company Plant, Island of Java, Indonesia

One of the world's most modern Cement Plants . . . Equipped with Kennedy Machinery.

Asia's most modern Cement Plant.

KENNEDY PRODUCTS

- Gyratory Crushers
- Swing Jaw Crushers
- Slugger Rolls
- Ball Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Coolers, Dryers
- Preheaters, Deheaters
- Fans, Blowers
- Hoists, Conveyors
- Classifiers
- Pneumatic Transport Systems
- Dust Collectors
- Complete Cement Plants
- Complete Lime Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems

NEW CEMENT PLANT OPENS IN INDONESIA

Special to The New York Times.

JAKARTA, Indonesia, Aug. 7 —Asia's most modern cement plant, an impressive example of Indonesian-United States cooperation, was formally dedicated today by President Sukarno in East Java.

The ceremony in the newly constructed industrial compound at Gresik, near Surabaya, represented an important event in the history of underdeveloped Indonesia, now struggling through her worst economic crisis. The cement plant, sprawling over several acres is expected to make a major contribution in helping strengthen the nation's economy and spur new industries.

From Gresik cement will be transported to scattered areas of the archipelago. Today's cement at Gresik will be tomorrow's new schools, houses, dams, hospitals, factories and bridges, all of which are badly needed by Indonesia's 82,000,000 people.

In a dedication speech, as reported here, President Sukarno thanked the United States for financial and technical cooperation in building the Gresik works.

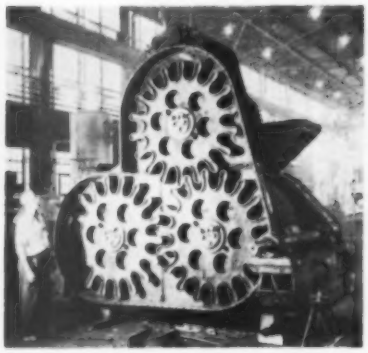
Cement experts said the plant had a capacity of 250,000 tons of cement a year, about 75,000 tons more than total present production. They said the plant was expected to save Indonesia about $7,000 a day in foreign exchange.

Reprinted from
The New York Times, August 8, 1957

Send for Bulletins describing Kennedy Machinery and Equipment

New Machinery
and Equipment

For Further Information Use Card on Pages 133-134



● Triple roll crushers are built by Pioneer Engineering, Division of Poor & Company, in three sizes—30 by 18, 40 by 22, and 54 by 24. Two-in-1 action of the triple roll greatly increases stage of reduction by accomplishing two passes of the material almost simultaneously. Illustrated are the Pioneer-developed star gears which assure positive drive of all three rolls. **(51)**

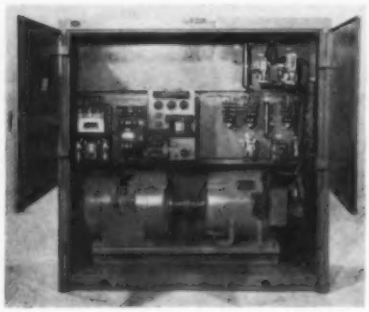
● First model to be produced in Thew Shovel Company's new Moto-Loader line is the Model ML-153, a four-wheel drive, 1¾-cu. yd. capacity front-end loader.

The new model is available with either gasoline or diesel power, and uses an Allison Torqmatic three-speed, power-shifted, full reversing

transmission and integral torque converter with a 2.5 to 1 ratio. Top speed is 21.4 m.p.h.

Two adjacent foot pedals—one for forward travel and one for reverse—give the operator instant direction control with one foot, while the other foot is used for braking.

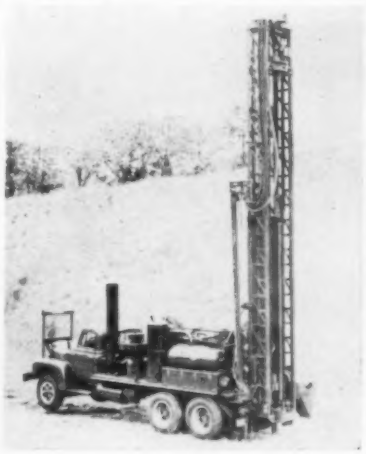
Hydraulic controls are mounted on the dash with a toggle hoist lever to allow constant hoisting force while the operator manipulates the bucket tilt control for quick breakout action. Bucket rollback at carry position is 40 deg. Forward reach at 7 ft. dumping height is 40 in. The peak lift capacity of the new Moto-Loader is 11,000 lb. at 0 m.p.h. with a carrying capacity of 6,000 lb. at 4 m.p.h. **(52)**



● A new line of packaged adjustable speed drives is being manufactured by General Electric's Direct Current Motor and Generator Department. Designed for minimum maintenance, the new speed variators are available in ratings of 3 through 150 hp. and in speed ranges of 8 to 1 and higher.

Standard on the new line is the new Amplistat regulator with silicon rectifiers, which provides smooth, timed acceleration and deceleration to preset speeds, in addition to voltage regulation. New static excitation system with silicon rectifier has no moving parts and requires no warm-up period.

The motor-generator set is a two-unit, four-bearing design. Standardized power unit control devices are unit-mounted and front-connected. Recessed wiring troughs eliminate wiring harness and improve accessability. Incoming power and control connections are simplified by terminal boards. **(53)**



● Schramm, Inc., has introduced a new diesel-powered, truck-mounted rotary drill which features lower operating cost because of reduced fuel consumption. Rotary air drilling is accomplished with the Rotadrill through a reversible hydraulic motor-driven head, mounted on a carriage that rides tracks mounted on the mast. Holes can be drilled to 700 ft. with 4½-in. OD drill pipe, and to 1,500 ft. with 2⅞-in. OD drill pipe.

The diesel engine is direct-coupled to a Schramm air compressor with no connection to the truck engine. Hydraulic pumps, the oil cooling system, and dust collecting fan are all driven by the diesel engine.

State and federal highway requirements are met by the Rotadrill. For long distance highway transportation, the mast is lowered, but the rig can be moved around the quarry with the mast up. Raised and lowered by hydraulic cylinders, the mast is 30 ft. high, with 25 ft. travel for 20-ft. 6-in. drill pipe.

Hydraulic control valves are mounted in three banks, complete with pressure regulator and hydraulic gauge for controlling down feed. There are individual valves for each outrigger, for forward or reverse motor rotation, for slow or rapid down-feed, and for the breakout cylinder. **(54)**

PRODUCE MORE STONE AND GRAVEL WITH MOBILE

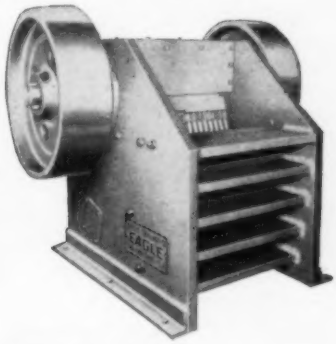
Eagle Crushers

Portable Eagle crushing plant operated by Harry Miller Contracting Co., Suffield, Ohio, delivers pit run sand and gravel at rate of 100-125 yds. per hour for cushioning concrete super-highway nearby. Whole layout can be moved as gravel is consumed. (Power source is electric generator set—could be gasoline or diesel direct drive.)

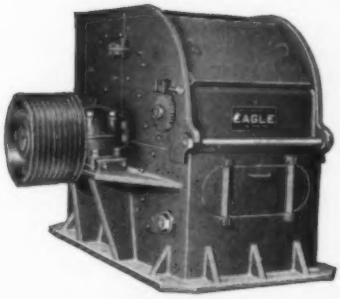
Eagle Crushers—both jaw type and hammermill—bear the characteristic marks of the experienced manufacturer—simple design, durable construction, ease of servicing. Eagle originated the one-piece, electrically welded frame —has pioneered in the field of portable, compact, crusher plants like the one above.

There is a range of sizes in the jaw crusher—and a variety of styles (skid-mounted, trailer, portable, roadside). Likewise, the hammermill or impact breaker is made in several sizes and for various applications—is particularly well suited to limestone reduction.

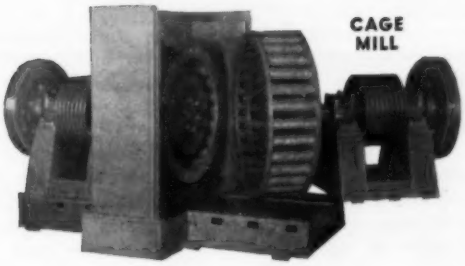
JAW CRUSHERS



HAMMER-MILLS



CAGE MILL

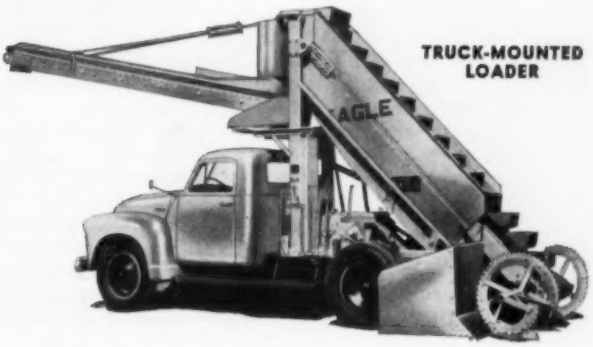


EAGLE CRUSHER CO., Inc. GALION OHIO-U-S-A

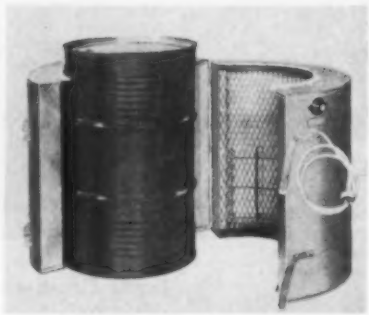
JAW CRUSHERS · IMPACT BREAKERS PULVERIZERS · CONVEYORS · LOADERS

You are invited to consult our engineers on your crusher problem — no obligation!

TRUCK-MOUNTED LOADER



● Made by the Forster Manufacturing Company, this bulk cement silo and trailer is available in a standard unit or custom-made to requirements. The unit, with pneumatic or conveyor-combination unloading, features low clearance and even load distribution. The 100-bbl. capacity silo is permanently water-tight. **(55)**

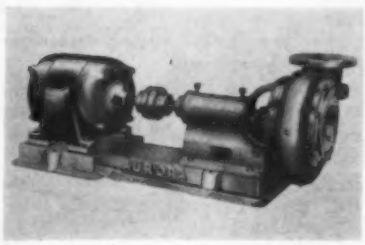


● Palmer drum warmers are now available in four sizes—55 gal., 30 gal., 16 gal., and 14 gal. All models have automatic temperature control in a choice of two ranges—100 deg. F. to 450 deg. F. or 60 deg. F. to 250 deg. F.

The warmer serves as a portable oven which can be taken to the point of use, eliminating the handling of hot drums. Well-insulated hinged halves fit around the drum with a flexible top gasket which allows for variations in drum diameters, yet fits tightly and prevents heat loss. **(57)**

● Western Precipitation Corporation has introduced its Transistomatic precipitator control for the automation of Cottrell precipitator units. Engineers of Western Precipitation describe the control as a trouble-free unit which requires no maintenance and no parts replacement. The units are completely sealed in electronic potting compound so that they are unaffected by moisture, dust, humidity, or other environmental factors.

In addition to modern transistorized circuitry, the unit embodies a new type of "sensing" principle which integrates total surge current in relation to time, providing a dynamic, continuous system of evaluating rate of surge current. **(56)**



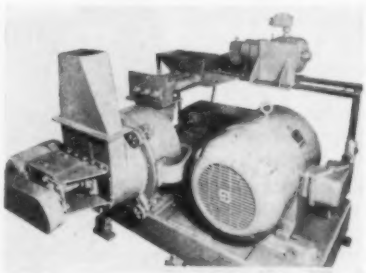
● A series of horizontal and vertical non-clog pumps offered by the Aurora Pump Division, The New York Air Brake Company, includes sizes ranging from 3 in. to 5 in. suction and discharge diameters.

Design includes Mono-Vane single passage impellers which can be trimmed to various diameters to meet requirements. Dynamic and hydraulic impeller balance is retained without the need for separate counterbalance.

Other features include smooth, quiet operation; steep curves which give good non-overloading characteristics; and detachable suction and packing covers which provide easy access to impeller area. **(58)**

● Availability of factory-installed LPG engines in cab-forward model trucks has been announced by the motor truck division of the International Harvester Company. This fuel system is available in models through the 4,200 to 60,000-lb. range in the International truck line.

Four International LPG engines were announced as available optionally in four and six-wheel A-Line conventional and cab-forward models. These are the 132-hp. Black Diamond 240, the 143-hp. BD-264, the 138-hp. BD-282, and the 155-hp. BD-308. **(59)**



● Strong Scott's Pulvocron air attrition impact pulverizer produces particle sizes from a range of 99 percent less than 5 microns, or as coarse as 50 mesh. This broad range is achieved through separate control over the rate of feed, grinding action, and classification at desired cut point.

Design of Pulvocron, which incorporates the combination of impact attrition and air attrition, provides maximum size reduction and minimum wear by material grinding against material.

In addition, the Pulvocron embodies an efficient air classifying unit based upon the principle of radial inward movement of fine particles in opposition to centrifugal force by the propulsion in an air stream. This produces fine particles with a minimum size distribution range, coupled with versatility and minimum operating and maintenance costs. **(60)**

WATCH FIRESTONE WHERE HEAVYWEIGHTS HUSTLE BIG JOBS!

Firestone Rock Grips fit your machinery to any job condition

Firestone Tubeless Rock Grips let you roll the big loads out ahead of schedule. Two great tread designs combine traction and toughness to move your heavyweights over any terrain without changing tires to match each job. You get the *full flotation* you need for sand and soft stuff. You get the *armored grip* you need for rough runs over splintered rock or shale. Safety-Tensioned *Gum Dipped*® NYLON bodies and cut-resistant treads defy gashes and bruising impacts—make Firestone the top choice of off-the-highway users. Your Firestone Sales Engineer will show you why you'll make them your top choice, too. Contact him today through your local Firestone Dealer or Store.

ROCK GRIP WIDE BASE ROCK GRIP

Enjoy the Voice of Firestone on ABC television every Monday evening.

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1957, The Firestone Tire & Rubber Company

● Two new models of "Paymover" towing tractors are announced by the newly established Towing Tractor section of The Frank G. Hough Co. These new machines are the Model T-50 with 5,000-lb. drawbar pull and the Model T-60 with 6,000-lb. drawbar pull. Both are two-wheel-drive machines. They are compact and maneuverable, featuring torque-converter drive and automatic transmissions. Additional models to be introduced soon will include four-wheel drive units with four-wheel steering. Head and tail lights are standard equipment on these new "Paymover" towing tractors and a wide variety of coupler attachments are available. (61)

● For easier lubrication of open gears and sliding surfaces the Whitmore Mfg. Co. now offers its liquid gear composition in a 16-oz. push-button aerosol container. The new product, called the "Handi-Lube," has met with favor in quarrying, mining, construction and manufacturing industries. In use, the "Handi-Lube" sprays a tough protective film of liquid gear composition on the pressure side of the surface from a distance of 12 to 18 inches.

The lubricant is weather-proof

and is available in light, medium and heavy grades, to provide the correct open gear lubricant under all conditions of climate. (62)

● Using the Holmes-Owen A500 Series truck loader, one man can load, haul, and dump his own truck. The loader, introduced by the Ernest Holmes Company, can be used with any standard dump truck body, and can be installed on almost any 2-, 2½-, or 3-ton truck.

The loader is furnished with three types of equipment. The standard loader with a scoop-type bucket is activated by double hydraulic cylinders on each side of the truck to permit one-man operation. Equipped with a forward tipping bucket, the attachment loads other trucks as well as itself.

The new claw-type loader (illustrated) can be used for picking up material from stockpile. The simple addition of one cross shaft converts the claw to a hydraulic tipping bucket loader. (63)

6 Ways Arcair Cuts Repair Costs On WORLD'S BIGGEST SHOVEL

HERE IS HOW . . . Arcair torches and Copperclad electrodes have cut costs substantially on the Mountaineer. Gouging hardened areas of manganese or high carbon pads, chains, bucket lips, teeth or sprockets with Arcair is faster, reduces lost time, permits better fusion to the parent metal. Cutting or gouging with Arcair eliminates four different methods of metal removal. It is 10 times faster than grinding and appreciably faster than other methods used. Welding helpers learn to use this torch in about fifteen minutes.

Using only an electric arc and compressed air, the patented Arcair torch used with genuine Arcair Copperclad electrodes is the new, efficient and money saving answer to most metal removing problems.

See proof of performance from many industries! WRITE TODAY for FREE Brochure.

Arcair COMPANY

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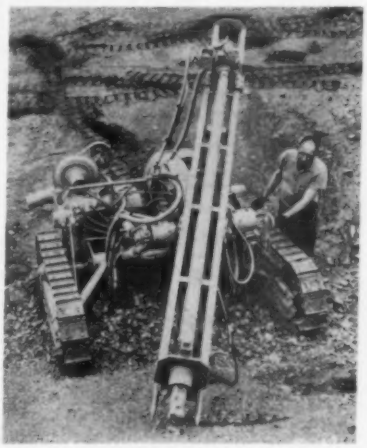


● The new 150 blast hole driller, built by the Reich Bros. Manufacturing Company, Inc., is capable of drilling holes as high as 7 ft., or as low as 9 in. to the ground. Horizontally, the 150 can swing in an arc of 150 deg.; it handles the same range in a vertical arc. All controls are in a single location for either driving or

drilling operations. The 150 blast hole driller is self-propelled on its own standard crawler tracks. Hydraulic power drives the tracks and the drill.

Fast drilling results from the combination of rotary drilling plus a continuous hammering action on the end of the drill. Supporting the drill at the drive end is a standard, hollow shaft Cone-Drive speed reducer, which also drives the unit from a hydraulic motor. The small 3-in. center distance reducer has a ratio of 15:1 to give the drill a speed of 60 r.p.m.

Compressed air is used for the hammering action on the end of the drill. This continuous shock load is easily handled by the reducer's double-enveloping worm gearing. **(64)**

● This installation of a T. J. Cope cable support system in a new plant carries all power as well as control circuits.

The system consists of 120 ft. of trough in 18-in. width and 150 ft. in 6-in. width, and handles a total of 1,200 hp. from 86 electrical motors.

Several advantages have been claimed for the trough system. Wires are easily accessible for rerouting, and plant expansion is simplified because the existing trough has sufficient space for laying new cables.

In addition, the Cope system can be quickly and easily installed. It is connected by pins driven through interlocking barrels welded to the ends of each trough section and fitting. These pins are secured in a matter of seconds, and the entire system can be installed at a substantial saving in labor cost.

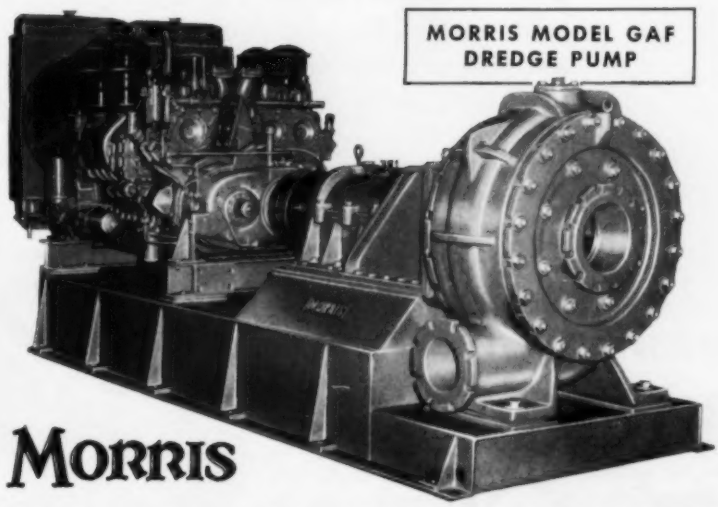
The Cope cable trough system can easily be tied in with an existing conduit system—cable can readily be laid over the side of the trough with special clamps available from the manufacturer. **(65)**

". . . It's what you

PUT ON THE BANK

that counts!"

MORRIS MODEL GAF DREDGE PUMP



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The dredge pump is the vital heart of any successful dredging or hydraulicking operation. Its ability to maintain high vacuum and freedom from mechanical difficulty makes the difference between profit and loss.

Morris Dredge Pumps, with their superior design and built-in dependability will consistently develop and maintain the high vacuum necessary to profitable production. Solids output of Morris Pumps so far exceeds that of ordinary pumps that contractors refer to them as their "secret weapon". Over 90 years experience in hydraulic design and testing are built in every Morris Pump. Let Morris help you "put more on the bank".

If you want to talk performance *and* durability write for Bulletin 184-A or contact your Morris representative.

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Cross-country trucking . . . quarrying . . . logging . . . mining . . . heavy construction . . . whatever your on- or off-highway hauling needs—one of the products in the complete Timken-Detroit line of lightweight, medium and heavy-duty, and planetary tandem driving axles will assure you more productive work time—faster, more economical maintenance . . . smaller parts inventory!

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gives you greater payload capacity. Up to 700 pounds lighter than any other unit of equal capacity, this new lightweight tandem will give you up to 26,000 extra ton-miles of payload in every 75,000 miles of operation.

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TIMKEN-DETROIT AXLE DIVISION

ROCKWELL SPRING AND AXLE COMPANY

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Products of

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TIMKEN-DETROIT HEAVY-DUTY TANDEM

with large rugged double-reduction gears is unequaled for dependable, economical operation under toughest conditions. Exclusive "Cradle Ride" suspension, with its long, resilient, floating springs, reduces road shock, stabilizes the load, and improves driver control. Some Timken-Detroit medium and heavy-duty tandems are available with worm drive.

ONLY TIMKEN-DETROIT OFFERS YOU ALL THESE EXCLUSIVE FEATURES AND ADVANTAGES!

Timken-Detroit Inter-Axle Differential divides torque evenly between axles, yet permit wheels of one axle to revolve faster or slower than wheels of other axle. Both axles do equal amounts of work. Driving parts and tires last longer. Controlled from the cab, the differential can be locked out at any speed to give positive through-drive.

Timken-Detroit "In-Line" Propeller Shaft Drive gives you straight-through drive. Bearing and gear life is greatly increased because universal joint working angles are materially reduced.

Unequaled Parts Interchangeability means easier maintenance. Almost all parts in TDA® tandems—gears, pinions, differentials and brakes—are interchangeable with parts from Timken-Detroit standard single axles. This means more productive operation time—fast, simple, economical maintenance, smaller parts inventory.

Famous Torsion Flow Axle Shafts are made even stronger through the use of more splines and greater root diameter.

Timken-Detroit Rectangular Shaped Axle Housings are forged from high carbon steel. This shape, plus TDA full strength corner sections, provides greatest strength possible with minimum weight and size.

Timken-Detroit Hypoid Gears with their larger pinions and greater tooth contact give outstanding performance, top efficiency and long life—plus lower maintenance costs.

Dependable Heavy-Duty "P" Series Air Brakes utilize a unit-mounted design to make a compact self-contained assembly. Open type spiders mean lower temperatures, longer liner life. Tapered "Econoliners" provide greatest thickness in area of greatest wear.

©1957, RS&A Company

WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS

● The Easton Car & Construction Company has adapted its standard off-the-highway drop door side dump trailer to meet state highway regulations while hauling maximum payload.

Known as the TD-1115, the new trailer is constructed of special alloy steels and has a tandem trailer suspension. Lights, directional signals, and splash guards meet highway regulations.

The trailer body's fully automatic door is essentially the same as on Easton mine and quarry drop door truck bodies and trailers. As the body is raised or lowered the door is opened or closed automatically. When in dumping position the door is flush with the floor of the body and provides a chute for the discharging load.

Dumping is accomplished by means of a standard push-button controlled Easton automatic electric overhead dumping system located at the crusher hopper.

The trailer is mounted to a six-wheel Autocar Model DC-7564 chassis with tandem drive. **(66)**

● Complete sand washing-classifying-dehydrating sections on wheels are now available from Eagle Iron Works. The new units consist of a standard water scalping-classifying tank with automatic bleeder valves and 3-cell collecting blending flume, and two single screw washer-classifier-dehydrators, compactly mounted on a chassis, for use with semi-tractor.

Size and weight permit highway travel from pit to pit. The unit can be hauled right into pit and positioned next to crushing and screening plant.

Simple manual control of metering "splitter" gates on tank in conjunction with 3-cell flume adapts the unit to a variety of pit conditions. Both screws can be used to produce one product or a different gradation can be produced with each screw, providing utmost flexibility.

Capacities range up to 200 t.p.h. of specification material.

Side flares on the washers are quickly removed for travel, as shown in the illustration. When the site is reached, the section can be set up for operation within an hour or so.

Available with gasoline engine or electric power, the units can be used in dry pit or pumping operations. **(67)**

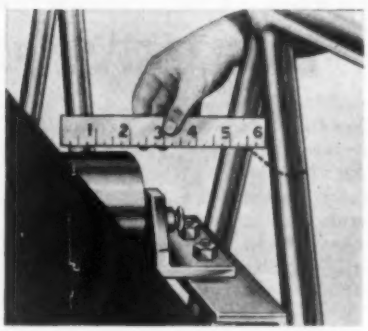
● Euclid Division has introduced a new front-end loader with a rated payload capacity of 19 cu. ft. Struck capacity of the bucket is 14 cu. ft.; maximum lifting load is 3,000 lb. Speeds range up to 11 m.p.h. forward or reverse.

Designated the Model L-7, the rubber-tired loader incorporates many features which provide maneuverability and ease of operation. Compact design permits operation in confined areas. An inter-connecting "inching" valve between foot

brake and the driving clutches within the transmission permits the machine to ease into restricted areas merely by operation of foot brake.

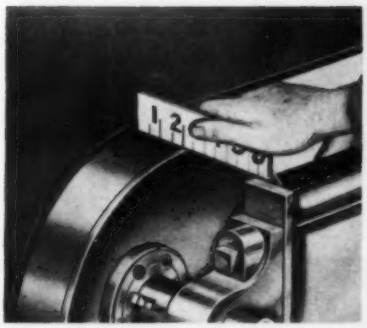
The "Euc" loader has rear-wheel steer; front wheel drive is powered by a 49 hp. Continental gasoline engine. Overall operating height is 6 ft. 9½ in.

The Easton Car & Construction Company has adapted its standard off-the-highway drop door side dump trailer to meet state highway regulations while hauling maximum payload. **(68)**



● According to the manufacturer, the E. F. Marsh Engineering Company, Marco tubular frame conveyors have special features which increase belt life providing greater protection against belt-edge damage.

These conveyors have 100 percent



more space (5½ in.) in the critical area—between the belt-edge and the nearest frame member during the return run.

Wider frames permit use of wider face pulleys. The new wider face Marco pulleys increase the distance between belt and pulley edge to 2 in., giving greater protection to the belt in this high tension area.

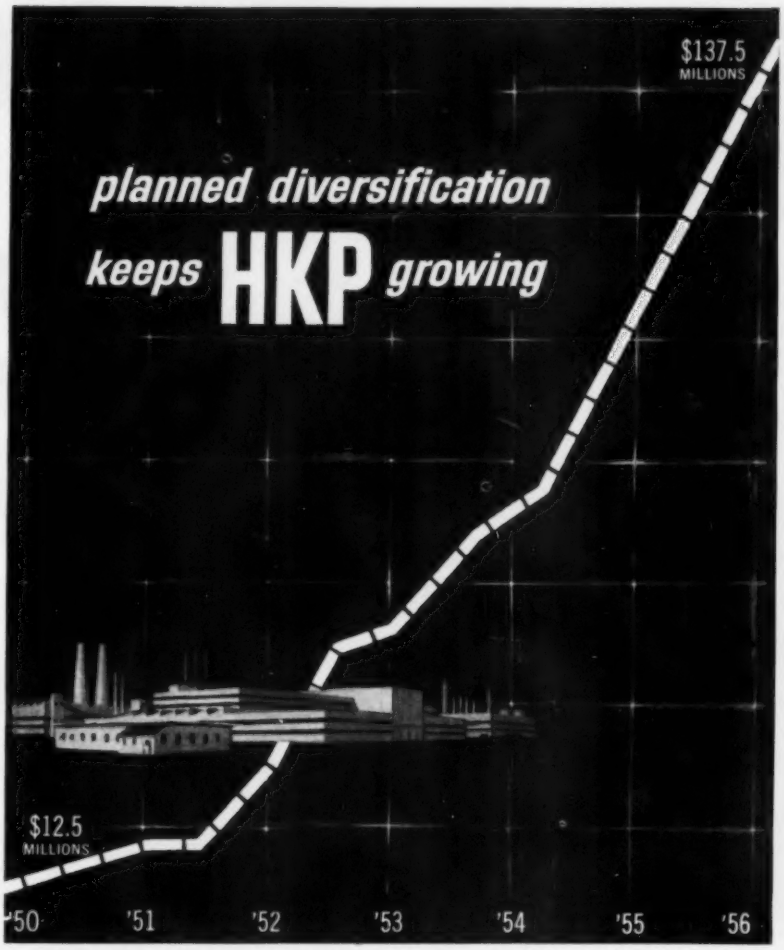
Should wind, uneven loading, or other factors cause belt wandering, the company claims this special conveyor design reduces to a minimum the possibility of belt damage or belt destruction. **(69)**

● An accessory unit designed for service with the Aircospot Gun in the arc-spot welding of light-gauge metals is available from the Air Reduction Sales Company.

The new Crater Eliminator Control functions to regulate automatically the cooling rate of Aircospot welds. With this unit, the arc does not end abruptly when the trigger is released and welding action stops; instead, its intensity drops to a lower level before it extinguishes. Consequently, the weld cools more slowly, which minimizes or eliminates the tendency toward weld cracking in certain metals which are cooled rapidly. This post heating of the weld produces a smooth, craterless spot of very good appearance. Post-weld current intensity and post-weld heat time are adjustable as required by material thickness and other variables.

In addition, the Aircospot gun has been modified by the installation of a new spatter trap which prevents particles of molten metal from entering the nozzle; the incorporation of an adjustable trigger stop; and various changes in the control panel.

The Aircospot equipment is used in the manual production of inert-gas-shielded tungsten-arc spot welds from only one side of a joint. **(70)**



Acquisition of The Cleveland Hardware & Forging Company brings to eleven the number of versatile Porter divisions. They manufacture products in 40 plants in the United States and Canada, four of which have been acquired so far this year.

Serving industry's needs is a prime responsibility at H. K. Porter Company, Inc. Porter maintains intensive development programs which are translated into new manufacturing developments almost every month.

This awareness of the needs of the market place has resulted in a program of planned diversification...**and a 1150% increase in Porter business volume since 1950.** This volume comes from divisions manufacturing steel and fabricated steel products, copper-alloy metal products, electrical equipment, refractories and industrial rubber, wire and cable.

H. K. PORTER COMPANY, INC.

CLEVELAND · CONNORS STEEL · DELTA-STAR ELECTRIC · HENRY DISSTON · RIVERSIDE-ALLOY METAL
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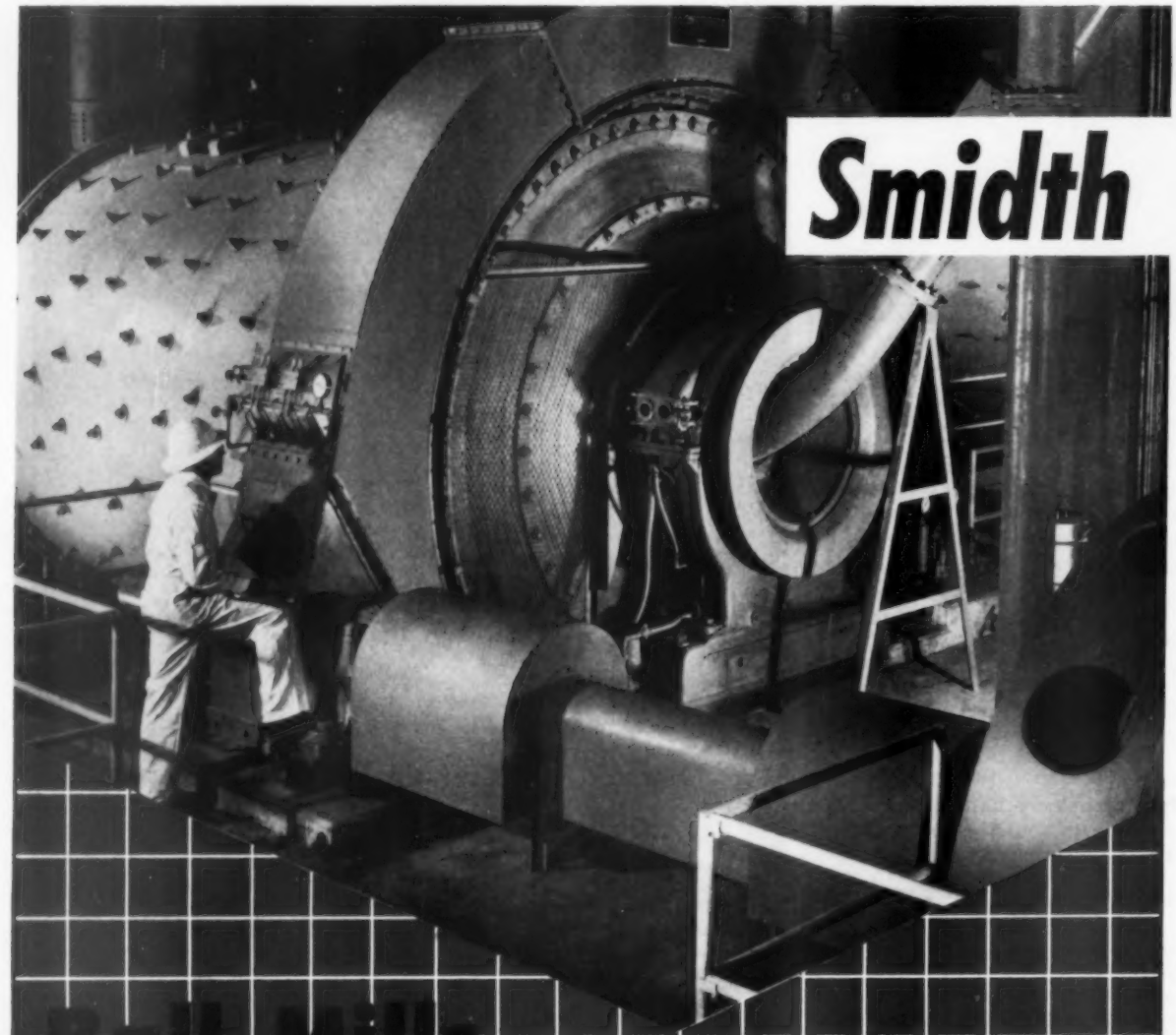

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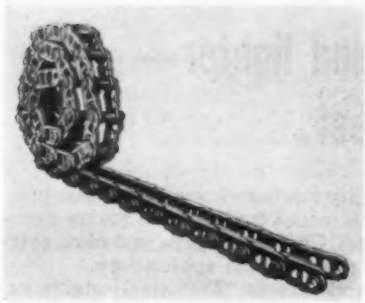
● Winter-Weiss Portadrill Model 6TA rotary drill has a rated capacity of up to 9-in. diameter holes. It is designed especially for heavy-duty blasthole work and explorations in rough terrain. It operates with a one or two man crew, depending on hole depths. All drilling power is supplied through power take-offs from the tractor engine. Since the drill is an integral unit, no auxiliary equipment is needed.

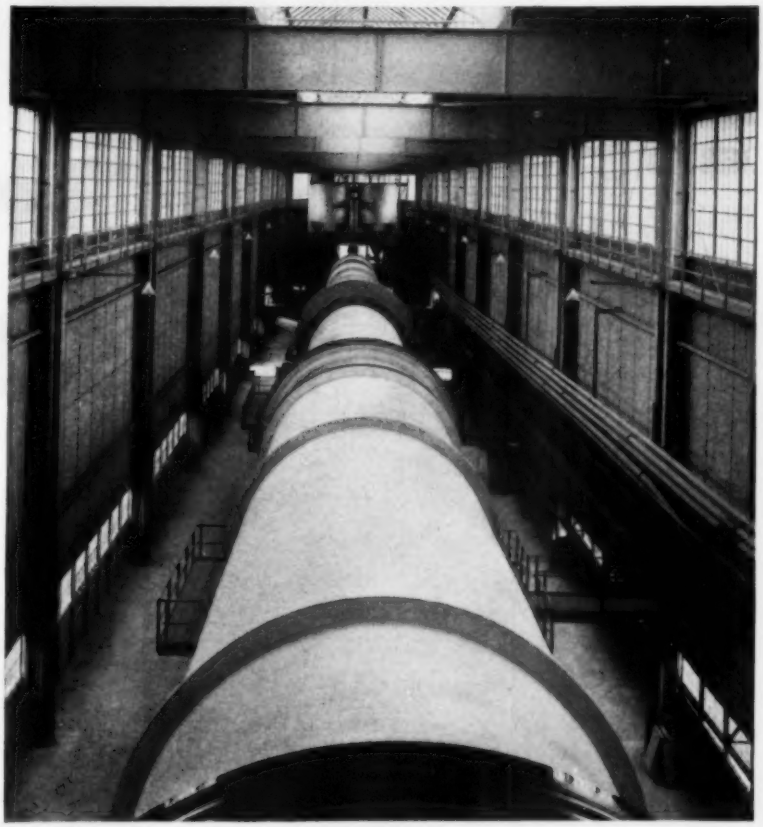
Hole cuttings are removed dry by compressed air and the cuttings may be used for sampling in exploratory operations or for stemming the hole in blasting. **(71)**



● Heavy-duty track rail specially designed for use on Cat D-8, D-7, D-6, and D-4 tractors has been added to the line of crawler tractor replacement parts available from the Hensley Equipment Company.

The new rail is forged from high quality steel, with pins and bushings of rolled alloy steel for greater strength and durability. Forged to Hensley's specifications, the track rails are said to reduce maintenance costs by requiring less parts replacement over longer period. **(72)**

New trends in the use of refractories



For peak production switch to Laclede high alumina kiln liners

When your kilns operate day and night, long refractory service and little maintenance become critically important. Then the use of Laclede high alumina kiln liners gives you the satisfaction and dependability you need. They offer advantages of unusually low porosity, high strength, high density, high resistance to fluxing action of clinkers and possess high refractory values.

Laclede 70 (70% alumina) liners are made of high grade, selected Missouri diaspore, expertly blended with bauxite and bond clays. They contain materials and blending skill, plus quality control that produces only "quality-first" refractories. Laclede Peerlac (60% alumina) meets the same type of standards.

Prompt service is also a Laclede specialty. Call on your nearby Laclede representative soon.

Laclede-Christy Works, Refractories Division,
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H. K. PORTER COMPANY, INC.
REFRACTORIES DIVISION
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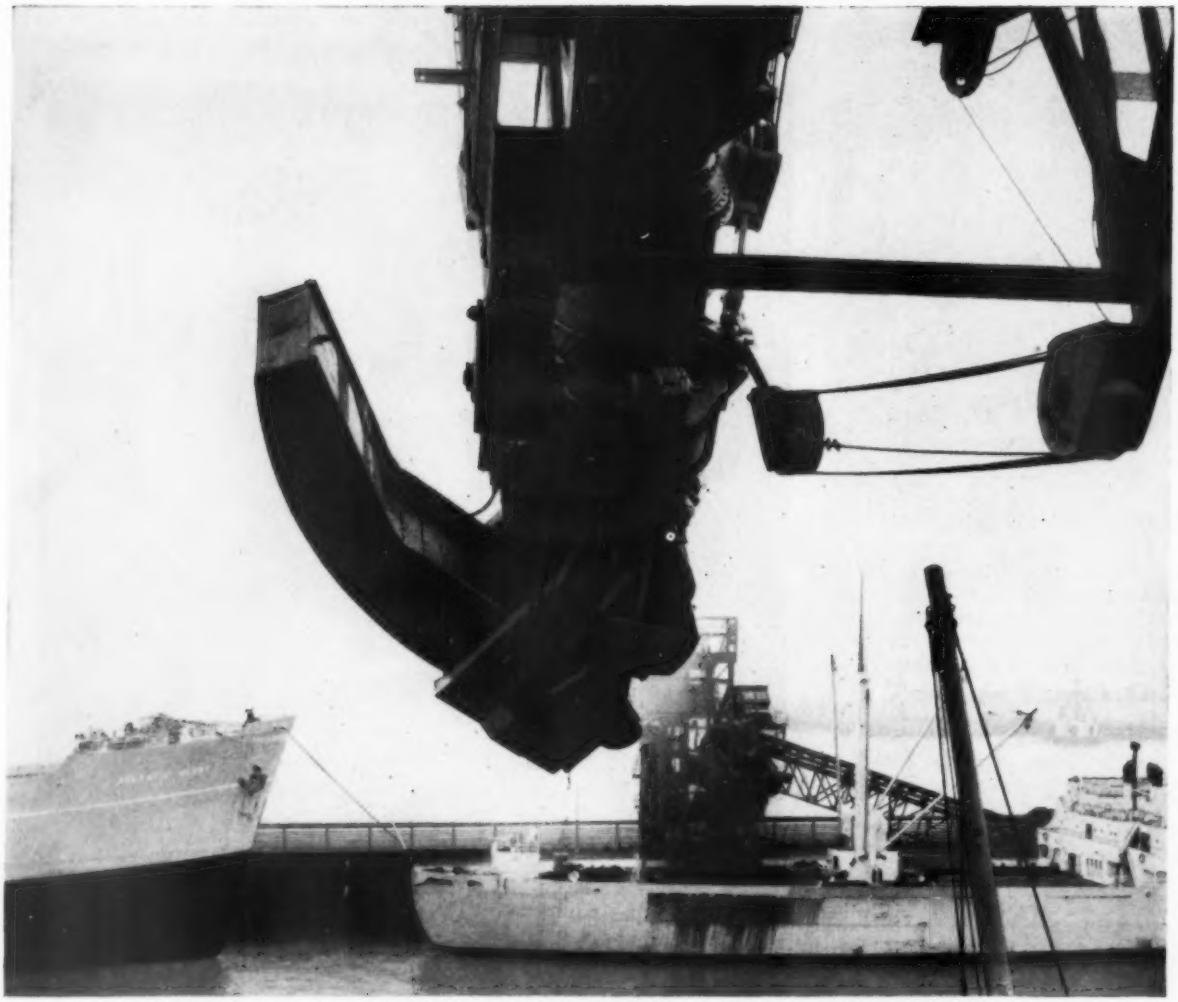

At world's most modern coal docks, Newport News, Va., C&O uses coal trimmers of Lukens "T-1" Steel.

New Coal Loading Machine is tougher and lighter—made with Lukens "T-1" Steel

TRADEMARK

Tough, weight-saving Lukens "T-1" gives this trimmer added mobility.

When the C&O Railway designed this huge new coal trimmer, they chose Lukens "T-1" steel for its combination of high strength and toughness—plus ready workability. Construction required less steel, produced outstanding abrasion resistance.

Now with stepped up efficiency, this mammoth machine easily and economically deposits 2,000 tons of coal an hour deep in the holds of ships—with a minimum of wear and maintenance.

Whether you handle coal, stone, gravel or metal ores, Lukens "T-1" steel used in areas hardest hit by punishing abrasive impact will save you money, too. It has tripled the life of rock driers. The 321 minimum Brinell quality has been known to outlast previous metals by 18 to 1 in quarry wear plates. Chutes, hoppers, and mine cars are other typical applications.

And Lukens "T-1" steel retains its remarkable toughness at temperatures well below zero. Send for our informative illustrated booklet, "Lukens 'T-1' Steel." Write Manager, Marketing Service, Room 965, Lukens Steel Company, Coatesville, Pennsylvania.

T1

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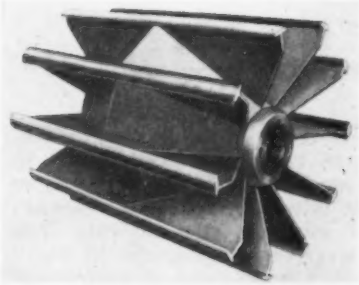
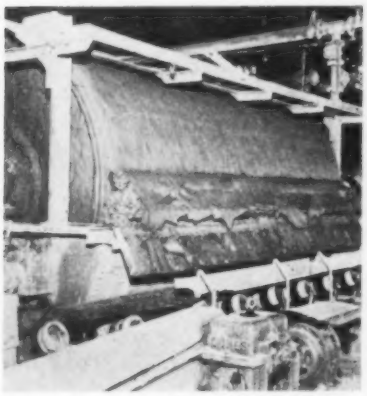
Helping industry choose steels that fit the job



● Van Gorp Manufacturing Company, Inc., has expanded its manufacturing lines to include steel self-cleaning conveyor pulleys.

The pulleys are available in 3,000 standard sizes ranging from 8 in. to 60 in. in diameter and from 8 in. to 66 in. in face width. Bore sizes range from ½ in. to 10 in.

Long life is provided by self-cleaning cone design which eliminates any material buildup between the belt and pulley, thus preventing belt misalignment. The outer edge of each individual wing is protected by a half oval bar which reduces belt strain and provides maximum traction. **(73)**

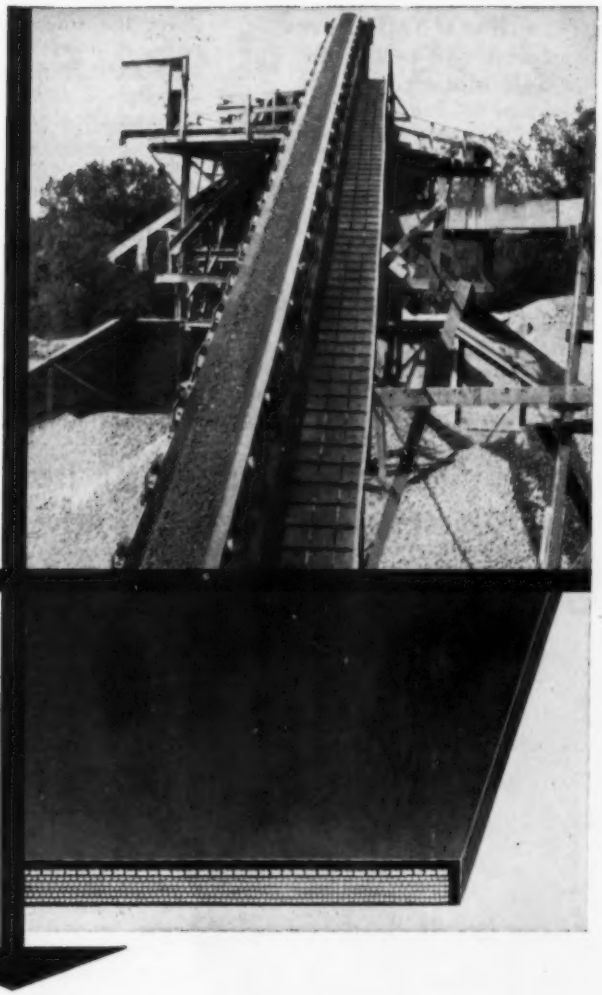


● Substantial savings in material and labor costs have been made by a cement plant through the use of Dynel filter cloths in slurry filtration units.

Dynel fabric, woven from Union Carbide Corporation's acrylic fiber, was chosen for this application because of its high resistance to alkaline solutions, acid, and abrasion.

In operation, the hollow drum, about 10 ft. in diameter, rotates through cement slurry while suction from the inside causes 1 in. filter cake build-up, drawing excess water through as filtrate. Cake then drops to a moving belt that feeds it to drying ovens. The Dynel filter cloth reportedly lasts nine months, eliminating frequent shut-downs for replacements. **(74)**

If you convey this . . .



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QUAKER CONVEYOR BELTING FOR TOUGH SHOCK RESISTANCE!

The Quaker belt you see above is made especially to take the impact and abrasive wear of sharp, jagged loads.

Carcass is formed of multiple plies of strong, high-quality cotton duck, with skim coat between plies. Average cover tensile strength is 2500 to 3000 lbs.

Do you need even greater troughability, flexibility or tension rating? Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics. Any desired cover thickness.

Your Quaker Rubber-Quaker Pioneer Rubber distributor also carries a complete line of hose, packing and moulded rubber products for every use. Call him today.

For further information, write to: *H. K. Porter Company, Inc., Quaker Rubber Works, Philadelphia 24, Pa., or Pioneer Works, Pittsburg, Calif.*

H. K. PORTER COMPANY, INC.

QUAKER RUBBER DIVISION

International Salt Leases Land Beneath Lake Erie For Salt Mining Project

International Salt Company, Inc., Scranton, Pa., has been granted a 50-year lease by the state of Ohio for a $7,500,000 salt mining project under the waters of Lake Erie.

The lease on more than 5,000 acres followed six years of prospecting and exploratory drilling by the company to determine the salt areas beneath the lake. Soil sampling and testing for sub-surface water is under way now in preparation for sinking a 2,000-ft. shaft on Whisky Island, where the company purchased 16 acres. A tunnel will be run out from the bottom of the shaft to the salt deposits.

International will pay the state 5 cents a ton for all rock salt mined. This base rate will be subject to change depending on the price of salt.

The South Dakota Cement Plant in Rapid City has awarded a contract for $263,390 to the Garland Construction Company of that city to construct a building to house raw materials and cement clinker and two service tunnels. The facilities are expected to be completed by February, 1958.

Directors of the Permanente Cement Company recently voted to change the company's fiscal year to the calendar year ending December 31 instead of January 31. This change will conform with the rest of the cement and gypsum industry and with Kaiser Industries Corporation and will result in an 11-month year for 1957.

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More GIANT Savings! . . . Now at

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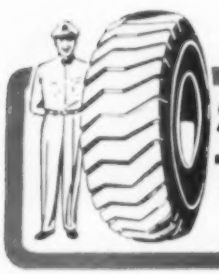
Probably more dirt and rock is hauled on Southern Tire retreads than on any other retreaded tires. That's because more and more contractors and heavy equipment operators are discovering the superior quality and economy of Southern Tire retreads.

Southern Tire offers not only the country's most complete range of tire sizes and tread designs, but also the world's finest retreading facilities — three-sectional molds that mean no buffing to breaker strips regardless of growth.

These facilities and use of finest tread rubber, plus Southern Tire's long experience, assure better quality with greater economy. Call your tire dealer now for facts about how Southern Tire retreads can save you as much as 40% of the price of new tires yet give you guaranteed new tire service.

All sizes — from 1100 x 24 to 33.5 x 33



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STATEMENT OF OWNERSHIP

Statement required by the Act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of PIT AND QUARRY, published monthly at Chicago, Illinois, for October 1, 1957.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, PIT AND QUARRY PUBLICATIONS, INC., Chicago, Ill.; Editor, W. E. Trauffer, same; Managing Editor, W. E. Trauffer, same; Business Manager, William A. Wilson, same.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

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Evelyn W. Montgomery, same.
Stanley A. Phillips, Elkhorn, Wis.
Florence S. Phillips, same.
Ray L. Smith, Jr., Bartlett, Ill.
Lanetta B. Smith, same.
William T. Klussman, Brookfield, Ill.
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Jeanette M. Cornyn, same.
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3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

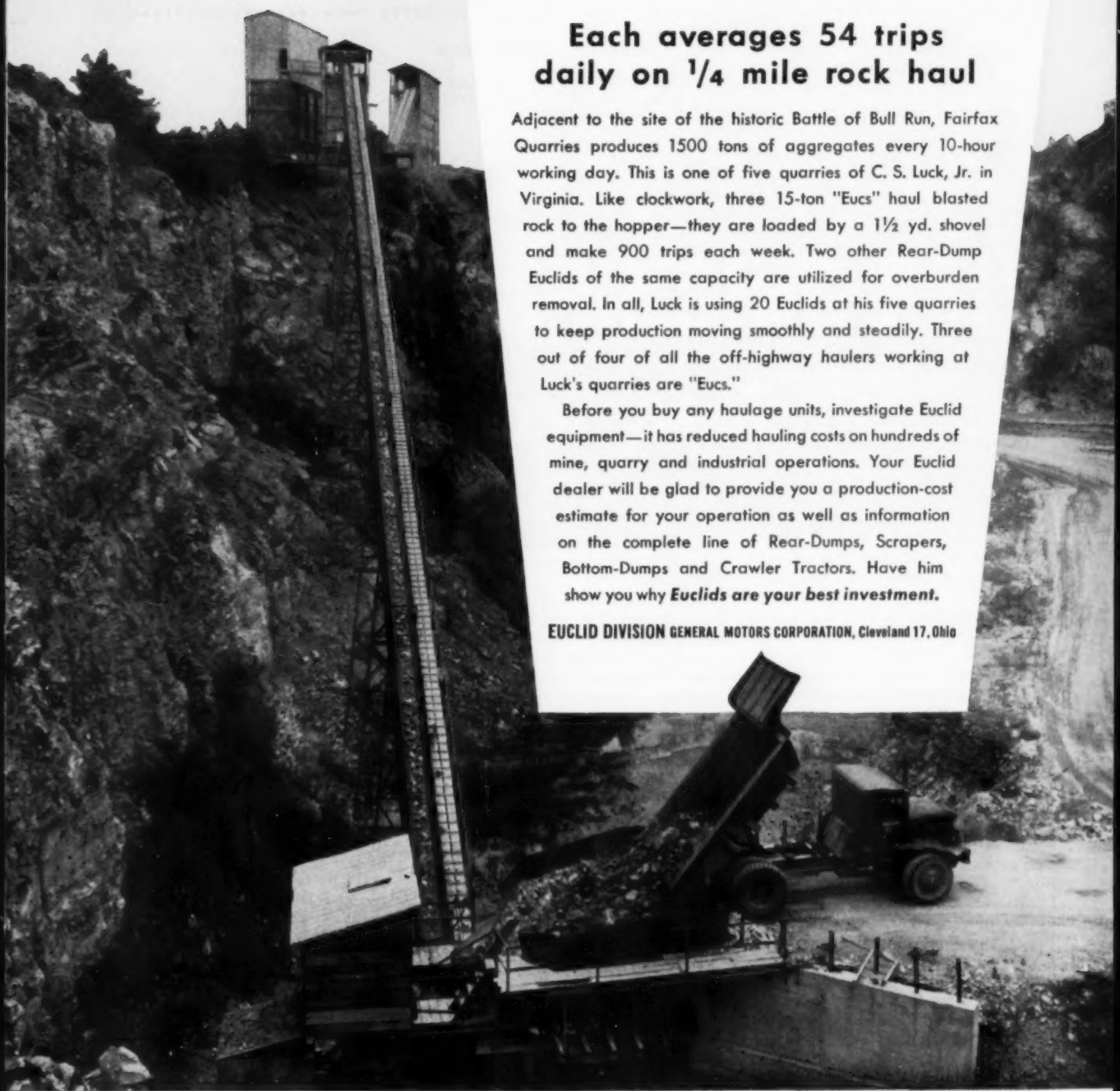
W. A. WILSON
Signature of Business Manager.

Sworn to and subscribed before me this 25th day of September, 1957.

(SEAL) JAMES G. KOSTKA.

(My commission expires March 23, 1960.)

3 "Eucs" haul 150 to 175 loads per day at Fairfax Quarries



Each averages 54 trips daily on 1/4 mile rock haul

Adjacent to the site of the historic Battle of Bull Run, Fairfax Quarries produces 1500 tons of aggregates every 10-hour working day. This is one of five quarries of C. S. Luck, Jr. in Virginia. Like clockwork, three 15-ton "Eucs" haul blasted rock to the hopper—they are loaded by a 1½ yd. shovel and make 900 trips each week. Two other Rear-Dump Euclids of the same capacity are utilized for overburden removal. In all, Luck is using 20 Euclids at his five quarries to keep production moving smoothly and steadily. Three out of four of all the off-highway haulers working at Luck's quarries are "Eucs."

Before you buy any haulage units, investigate Euclid equipment—it has reduced hauling costs on hundreds of mine, quarry and industrial operations. Your Euclid dealer will be glad to provide you a production-cost estimate for your operation as well as information on the complete line of Rear-Dumps, Scrapers, Bottom-Dumps and Crawler Tractors. Have him show you why ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Labor Developments

Payments to Joint Industry-Labor Boards Illegal

THE construction industry may have made labor law again in a recent case.

On the West Coast, sheet metal contractors and the sheet metal union organized a joint board, composed of six members representing each of the parties, for the following purposes:

"To aid in the settlement of disputes between the union and the employers' association,"

"To set up a joint arbitration committee,"

"To supervise and administer an apprenticeship program,"

"To provide a forum for discussion of the problems of the industry," and

"To co-operate with public and quasi-public bodies with regard to legislation and other matters of interest to the industry."

This board also was to administer a fund to which the employer members of the association were to contribute 2½ cents per hour worked by all journeymen and apprentices employed in the particular kind of work described in the agreement.

At first glance, a board organized for these purposes looks like a substantial forward step toward labor peace and one which would be unlikely to run afoul of the law. So long as no one complained, the arrangement appears to have worked quite satisfactorily.

Recently, however, a new group of employers went under its coverage, and one of those employers complained about being required to pay the 2½ cents per hour. He took his complaint to court and lost his case in the lower court. However, upon appeal to the U. S. Circuit Court, his position was upheld, and the contributions requirement was found to be in violation of the Taft-Hartley Act.

The court arrived at this result through a rather curious reasoning process. The Taft-Hartley Act includes a provision that, "It shall be unlawful for any employer to pay

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations

Washington, D. C.-Philadelphia, Pa.

or deliver, or agree to pay or deliver, any money or other thing of value to any representative of any of his employees . . ." The court came to the conclusion that the joint board had to be regarded as a representative of employees and that therefore it was illegal for employers to pay any money to it.

Whether this decision will be appealed to the Supreme Court and whether the Supreme Court will agree to consider it, is not now known. If it should not be appealed or if the Supreme Court should agree with the present ruling, a wide variety of employer-union relationships would be thrown into jeopardy. The most important of these is the Joint Board for Settling Jurisdictional Disputes in the Construction Industry.

This board has operated with a high degree of success both in avoiding shutdowns over jurisdictional disputes and in reducing their duration. It, too, is partially financed by employer contributions. Nevertheless, it is not universally popular, and the U. S. Circuit Court ruling might provide a basis for further attack on its legality.

Finally, the same ruling raises some fundamental questions about financing of boards of arbitration on which both employer and union representatives sit.

It would be unfortunate, indeed, if a highly legalistic interpretation of a section of a law clearly designed to reach quite another problem, namely, payoffs to union officials, should result in weakening or destroying joint employer-union arrangements which make a real contribution to labor peace.

The Teamsters and the AFL-CIO

At this writing, the Teamster's Union has just defiantly elected James R. Hoffa its new president, and the action of the AFL-CIO with respect to that union's continuance as a member of that body is being awaited.

Although very few employers can be found who have a kind word to say for the Teamsters or their current leadership, genuine concern is growing in employer circles about the consequences of its expulsion from the parent organization. Offhand, most employers might be expected to look with favor on the prospect of the labor movement weakening itself through internecine warfare. However, when the next step in considered, the prospect becomes somewhat less entrancing.

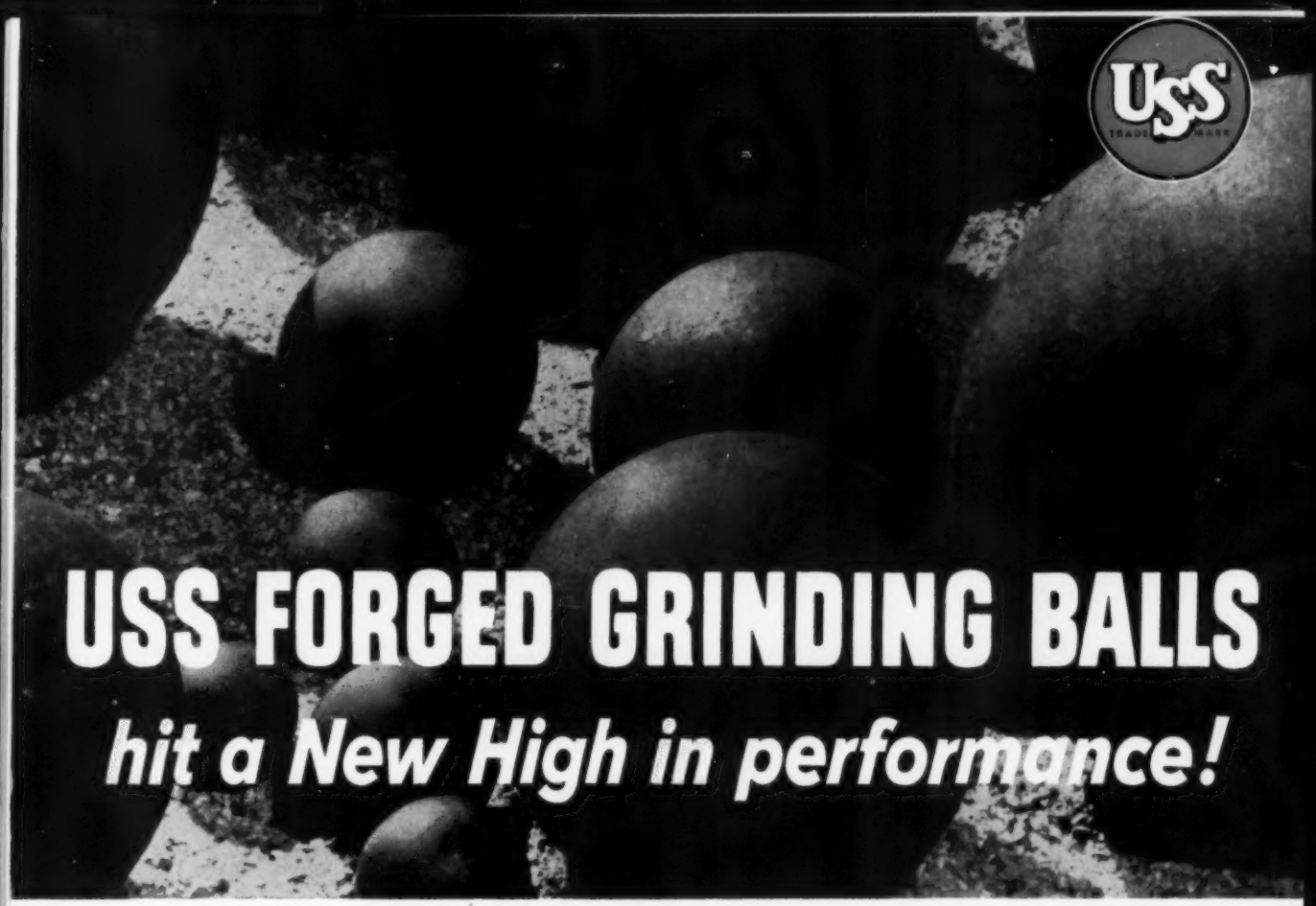
In the current situation, no knowledgeable observer of the labor scene really expects that expulsion of the Teamsters union would lead to any immediate diminution of power of either the Teamsters or the remaining AFL-CIO. Instead, a new set of alliances is predicted.

The most likely prospective alliance is one that is giving thoughtful employers much cause for concern. It is, of course, the much discussed federation built around the Teamsters, the Mine Workers, and the Longshoremen. Such a federation might attract to it other unions expelled or in danger of expulsion from the AFL-CIO, such as the Bakery Workers. This would be a formidable combination of the most censured elements of the labor movement, those least responsive to public opinion.

While the Mine Workers have not been the object of interest in recent revelations of corrupt practices, their dictatorial centralization is a matter of public record, and their defiance of the government during war-time will long be remembered. Also, their recent relations with the Longshoremen, a union which has become synonymous with corruption, have done nothing to enhance their reputation.

A new labor federation built around these least responsible groups could hardly be expected to forego the opportunity to raid other unions wherever possible. There are many victims of this kind of inter-union rivalry. Among them are the employees, whose welfare rarely plays a very important role. Many employers also suffer, and their establishments become the battlefield in

(*Continued on page* 101)



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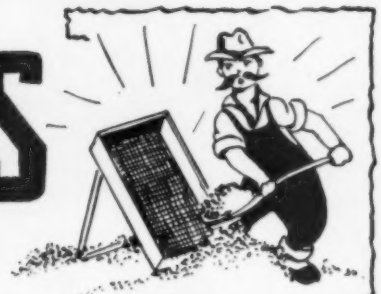
U N I T E D S T A T E S S T E E L

SCREENINGS



By RAY L. SMITH JR.

THE CHINESE call words that mean something "full words." Those that just make a noise and look pretty they call "empty words." Too many of the business letters we see are loaded with "empty words"—instead of getting to the point, the writer climbs aboard a verbal merry-go-round and out pops a letter full of generalities with little or no "oomph" behind it.

For instance, here is part of an opening sentence of a letter dictated by a department head who toils for a major heavy truck manufacturer and should have been able to steer straight.

"Frankly we are going to have to begin to commence to get ready to do some promotion."

Isn't that a darb? Equally delightful as a tonsil exerciser but painful to see in a business letter, is a sentence cited by a friend of ours in a recent lecture.

"Could you come to our office tomorrow which will be today when you get this letter on Friday?"

Whoever dictated that sentence was either thinking about something else or not thinking at all. The result is a vague combination of words of very small meaning or purpose.

Words are tools with which we convey thoughts. They must be carefully selected and used frugally. Many a letter that we get is full of sound and fury, of repetition and exaggeration, but leaves not a single clearly etched fact in our poor head. Your reader never wants GENERALITIES—he wants FACTS.

How "utmost" is utmost? How "beautiful" is beautiful? Meaningless words these unless they are explained and interpreted.

Dont take a ride on the verbal Merry-Go-Round—save that joy for the circus.

Potpourri And Succotash

We have just been told about a mother whose last words to her small son before he went off to a birthday party were: "Johnny, dear, be sure to thank Mrs. Hawks after the party. And for goodness sake, if there's any food you don't like, just don't discuss it!"

Well, everything went along well until, on leaving, Johnny shook hands with his hostess.

"Thank you for the cake and ice cream," he said dutifully. "We won't discuss the other stuff."

The normally sour-faced boss smiled genially at all the salesmen he had called together for a meeting.

"Well, gentlemen," he said, "I've called you in to announce a big sales contest which I am starting immediately and which I will personally supervise."

There was an excited murmur from the assembled salesmen, and an eager voice from the rear called out:

"What does the winner get, Mr. Smithson?"

"He gets," answered the boss, "to keep his job."

A nearly recovered inmate of one of the larger mental institutions was showing a writer and his wife around the place. After going through the grounds and various buildings they reached the outer office, where the writer's wife noticed a clock on the wall.

"My goodness, look at the time on that clock. It's all wrong!"

"Well, sure, lady," answered their guide, "if that clock was right it wouldn't be here."

A lady friend of ours usually phones the garage to pick up or deliver her car. But one day she decided to take it in herself for a few minor repairs.

After leaving instructions with the head garage man, she was on her way out when sharp and clear over the loudspeaker came a voice.

"Hey, Al, fill up Miss Watkins, giver her a wash, and see why she's been stalling."

Anyone For Grasshoppers?

HERE'S a new way to lose weight —a high insect low calorie diet. Silkworms, baby eels and lily bulbs are good for the waistline too, according to the latest dope. All of these things are delicious and nutritious. They make dieting so pleasant.

Among the many rare and unusual tid-bits are roasted caterpillar, fried grasshopper and Za Za insect, a Japanese fly used as a cocktail snack.

There are also skewered baby octopus, brood of baby eels in olive oil, Japanese pate made of fish entrails and salt, lily bulbs in syrup, boiled quail eggs, broiled sparrows packed like sardines, two in a can and larks stuffed with cream of truffled goose liver. Two larks come in every can with their little claws folded. And as a must with your cocktail,—fried silkworms, fried bees in cotton seed oil or seasoned baby bees in soy sauce.

Pickled rooster combs come at $2.45 a jar. They are supposed to be served instead of watermelon pickles or spiced peaches. A most favorite one is fried worms. They are very tasty. It's like parched corn— (so they say). Things like French-style snails and rattlesnake are so commonplace these days they aren't worth mentioning.

Right now we'd like to get some good roasted grasshoppers. They're much more crunchy than the french fried ones.

Now that we've succeeded in whetting your appetite we'd like to offer two delicious recipes for cocktail snacks. They can be used at your next memorable celebration.

Spread cream cheese on crackers, mount a grasshopper in the center of each, as if ready to take off. Sprinkle shredded carrot around the edge, and it really makes a lovely cocktail snack.

You can use brood of eels very nicely as a canape, too, especially if you turn their little heads up. They have little black eyes, and they look awfully cute on a cracker.

That's all they said, by the way. If you still don't know how to do it, try paying attention next time.

Sorry, Doc, but it just won't do.

You.. WOULD GUESS THIS DAVIS RIG COST MORE THAN IT REALLY DOES... ...after you compare what you get!

When you compare all the features of the Davis Loader-Backhoe with all the others, you would just naturally think it would cost more.

The truth is, it actually costs less than most other makes. And now is the time to see your Davis Dealer for a deal!

The Davis Loader-Backhoe **does** have more to offer that will save you time and make you more money. Visibility is just one. The loader has strength built in so no braces mar your vision. You sit high on the backhoe so you can see exactly where you're digging and the seat moves with the boom to let you always face your work.

Consider utility, maneuverability, strength, quick detachability, quality construction and power (with 7,000 to 10,000 pounds of breakaway on the backhoes) you will come up with the same answer that thousands of backhoe and loader users have, "Davis is the best buy, bar none." Better get in to see that Davis Dealer today!

...and look what it does!

Only the Davis 210 Backhoe can dig flush alongside of a building like this. It has three interchangeable digging positions—from either end or from the center of the frame. It utilizes an exclusive rotary hydraulic boom swing cylinder that provides 200° continuous operating arc.

Davis Loaders and Backhoes are available for all popular models of International, Ford, Fordson, Major, Ferguson, Case, Massey-Harris, Allis-Chalmers, Oliver, John Deere, Work Bull and Minneapolis-Moline Tractors.

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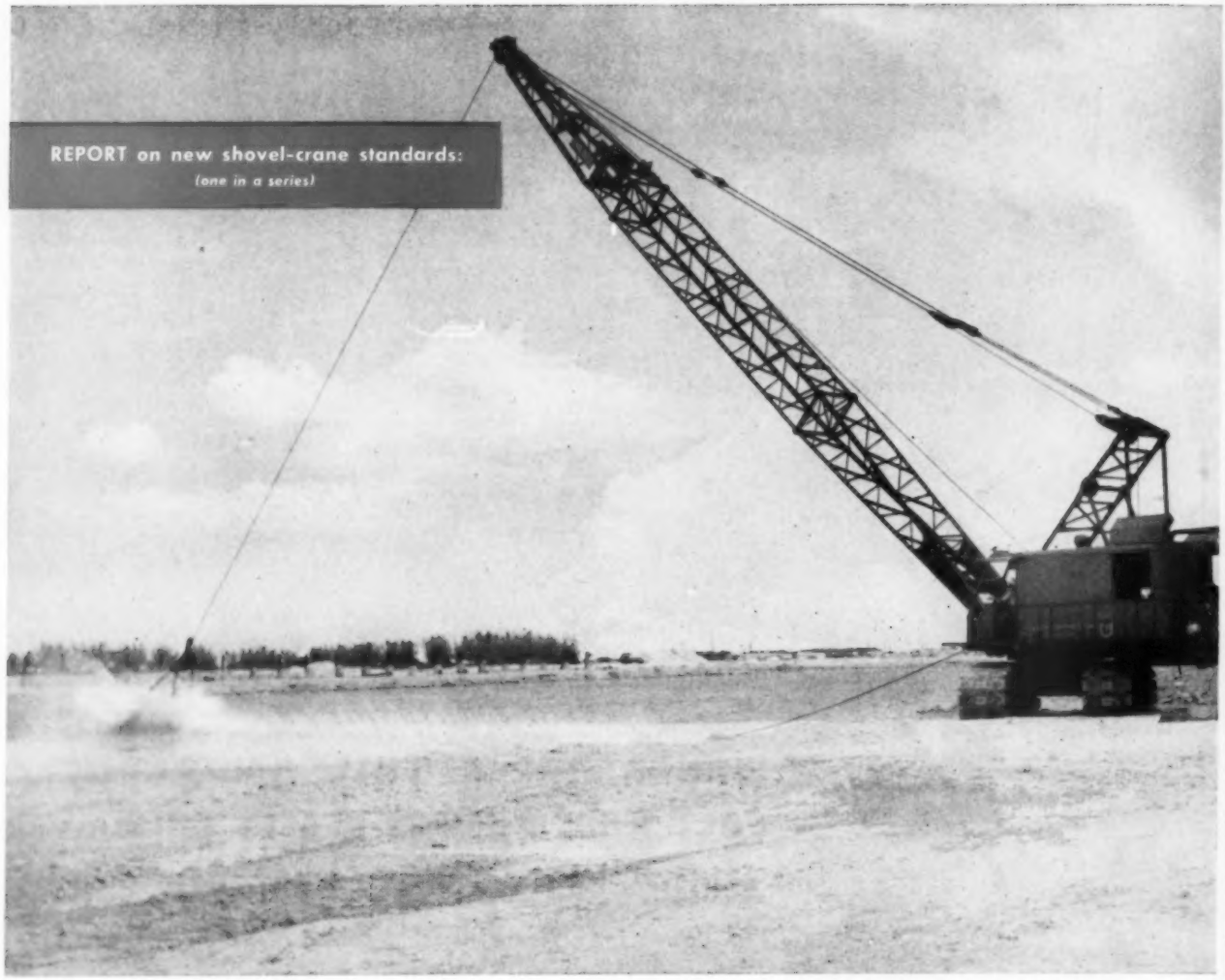


Upping cycles per shift with

Standard on every Link-Belt Speeder, Speed-o-Matic fingertip controls minimize operator fatigue. Response is fast, positive, precise

Exclusive with Link-Belt Speeder, this true power hydraulic control system utilizes oil under pressure. An engine-driven pump supplies pressure to put the machine through its paces at the flick of the operator's wrist. Result—he's not subject to costly end-of-the-shift letdown... he stays fresh, works at high speed *all* shift.

Hydraulic-actuated clutches . . .

engage smoothly, surely . . . eliminate jerk, jump or lag. There's perfect feel of the load for high-speed with safety and accuracy. Self-compensating for heat and normal lining wear, the clutches eliminate frequent stops for clutch adjustments . . . convert downtime into productive time.

Advanced design throughout

When you put a Link-Belt Speeder on your job, you get a machine that's years ahead of the field . . . a machine tops in production profit, unusually low in maintenance and service costs. See how you, too, can set new high standards of shovel-crane performance, earn bigger return on your equipment investment. See or call your Link-Belt Speeder distributor for the complete story or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,328

High speed stockpiling

Three yard dragline at left features exclusive Speed-o-Matic controls as standard equipment. System utilizes oil under pressure maintained by engine-driven pump through variable pressure valves, transmits pressure through oil directly to the hydraulic-actuated clutches. Engagement is smooth, precise. Operator has perfect feel of the load for effective work even when the bucket's under water.

More usable horsepower

Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

power hydraulic controls

Self-compensating clutches

Hydraulic-actuated pistons automatically adjust for heat and normal lining wear. Hydraulic pressure is unaffected regardless of the distance the piston moves to engage clutch.

Adds an hour's output per shift! Independent-Swing-and-Travel, available on 11 models, eliminates shifting, saves 20-30 seconds each machine move. All operations are completely independent of each other.

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

UNKRA Finances Korean Cement Plant Costing $9,000,000

AN OUTSTANDING symbol of international co-operation is nearing completion in a now-peaceful valley of South Korea. By the first of the year, a new 200,000-metric ton per year cement mill near Mungyong, should be in routine operation. Construction costs of near Mungyong should be in roumill were allocated by the United Nations Korean Reconstruction Agency to this project—one that brings Korea its second cement-producing operation.

The international character of this effort is seen in the Danish engineers (F. L. Smidth) who are supervising construction; the machinery and materials that are coming from Belgium, Denmark, Sweden, The United Kingdom, and the United States; and the Korean workers who are carrying on the building with skilled hands and strong backs.

Location of the mill at this site is due to a favorable combination of stone and fuel resources in the area. The anticipated daily demand of 1,500 tons of limestone will be met by a new quarry on Round Mountain, which borders the valley where the plant is being constructed. Other nearby mountains provide reserve deposits that will meet requirements far into the foreseeable future. In addition, approximately 20 to 25 years of fuel reserves are available in the nearby Eunsong coal mine, which is currently being modernized. This operation will incorporate a coal preparation plant to ensure a top-quality fuel.

Gypsum needs of this facility are being met by shipments from Kaiser Gypsum's quarry at San Marcos Island in the Gulf of California. An indication of the buildup of this basic industry in Korea can be found in the role played by this U. S. firm. Three years ago the company made its first shipment—of several hun-

The Mungyong cement plant at a stage nearing completion. This facility, which is being constructed by the United Nations Korean Reconstruction Agency (UNKRA) at a cost of nearly $8,500,000, will have a capacity of 200,000 metric tons of cement per year.

dred tons on a berth line vessel—to the 100,000-ton mill at Samchok, Korea's first and only other cement plant. However, in June of this year, a full cargo was dispatched to the Mungyong site.

Designed as a wet-process operation, the Mungyong plant will have the following facilities: two 410-ft. kilns; the customary slurry basins and finished product silos, a storage building 200 meters long with overhead crane for handling of raw materials and clinker, raw and finish mills, and its own 8,000-kw. electrical power plant. The latter will also be provided with fuel from the Eunsong mine. While the original plans called for a 100,000-metric ton output, the need for greater capacity entailed incorporating two kilns in lieu of one.

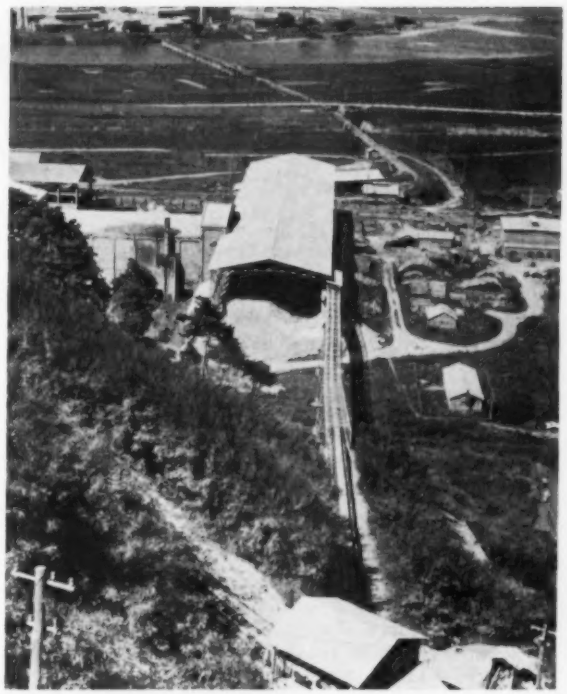
Along with the plant proper, a number of auxiliary buildings—including a laboratory, offices, and shops—were built. In addition, a complete village containing homes and a school was built for the workers and their families. The buildings were constructed in the Korean style earth-and-cement blocks.

In view of the shortage of mechanical building in this wartorn country, practically all of the concrete poured during construction was handled by native laborers, who carry concrete buckets slung from A-frames. Construction engineers on the job estimated that mechanical units would have increased daily pours by only 10 cubic meters.

Due to the fact that cement production has been a major consideration in the Korean economy since 1945—with additional demand created by the damage incurred during the Korean War—the expansion of production capacity has been the largest single effort undertaken by the UNKRA.

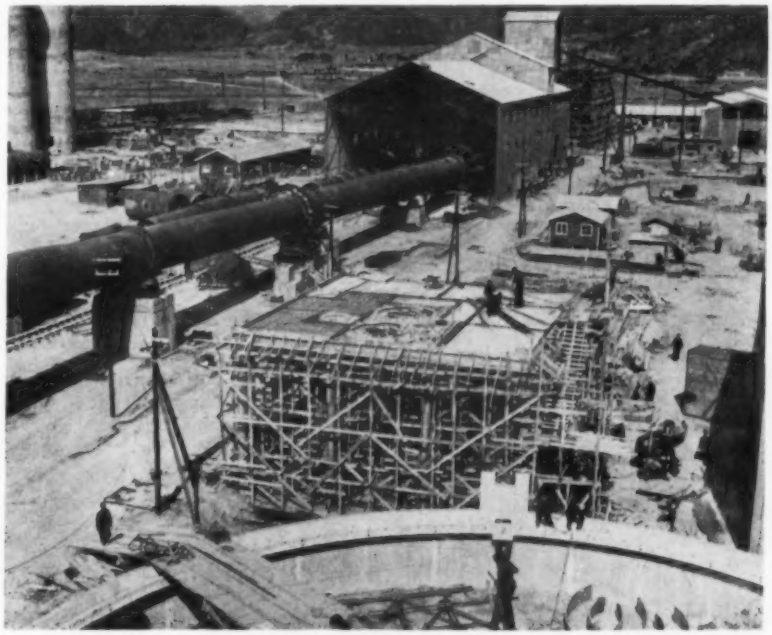
The first step in that program was the rehabilitation and modernization of Korea's original cement mill of the Samchok Cement Company. As a result, capacity of the latter was raised from about 60,000 to 200,000 metric tons annually. The next step was the construction of the new Mungyong plant, which will aid in meeting the estimated 600,000-metric ton future requirements of the country's economy.

modern methods, techniques combined with native labor in construction of plant



At Samchok, the capacity of Korea's only major existing cement plant, situated on the east coast, has been increased by a $631,000 rehabilitation project completed by UNKRA. An essential part of the project is a 2,200-kw. power plant.

The first of two big kilns being installed at the Mungyong cement plant. -In the foreground is the curved rim of the flotation thickener, and in the center foreground is the flotation cell house. Cement silos are on the extreme left.



New Developments In Surface Mining Equipment

By C. P. MONTI
Research and Technical Department
The Texas Company

PART II

Transportation Equipment

Railroad Equipment—Until the development of dependable off-highway trucks, rail was the predominant form of transportation in large mines. Now they are used only for long hauls or in the largest mines.

Early equipment ran on narrow-gauge track. Today, standard-gauge cars and diesel-electric locomotives are used in most cases. This equipment has not changed radically over the last few years and should be fairly familiar to most readers.

Trucks—Many types of trucks are used in open-pit operations. Although small-scale operators may use standard heavy-duty highway equipment, the major hauling is done with giant off-highway units. These can negotiate a 12 percent grade with full load, as compared to one of 3 percent for railroad equipment, thereby reducing by as much as 75 percent the horizontal distance that must be travelled in hauling out of a mine of a given depth.

Designs vary considerably. Both rear-dump and tractor-trailer types are used. The tractor-trailers can unload either by tilting sideways or else through an opening bottom whose action resembles that of a clamshell bucket. Capacities have increased greatly. Rear dumps carrying up to 50 tons and tractor-trailer haulers of up to 51-ton capacity are available. These are maximum sizes, and units from around 22 to 34 tons are currently more prevalent.

Horsepower has risen tremendously. Twin-engines are used in some cases to achieve this power increase. Rear-dumps run as high as 600 hp., and tractor-trailers up to 400. Again, these are maximum. Diesel engines are used almost exclusively in off-highway equipment, although some LPG (liquefied petroleum gas) engines are available. Turbo-superchargers are being used to obtain the horsepower ratings mentioned.

Torque converters, power brakes, and power steering are standard equipment on most units.

Tandem axle designs are used in conjunction with twin power in some units, each axle being powered by one engine. Four-wheel drives are widely used in tractor-trailers.

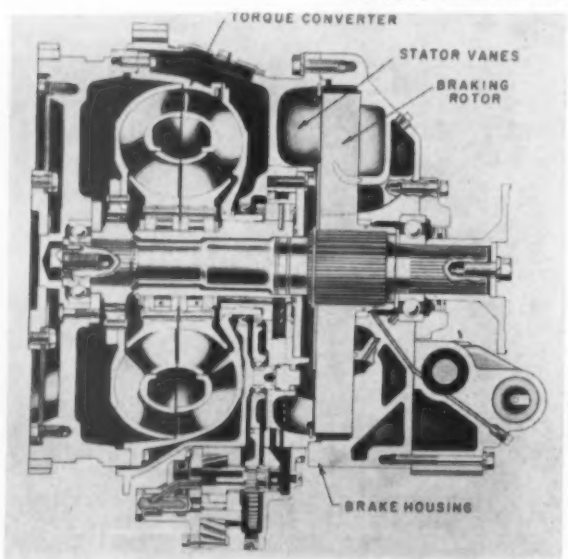
Hydraulic retarders have improved safety and reduced brake wear on downhill grades.

Improved tires have reduced down time for tire repair and increased maximum load per axle, thereby permitting larger designs without adding more axles.

To prevent frozen iron ore from adhering to the dump body in northern winter operation, provision has been made to channel the engine exhaust gases through hollow passages on the reinforcing members of the dump box. A slide fit joint automatically disconnects the system when the box elevates for dumping.

Automatic lubricators have been

Courtesy of Allison Div. GMC



A Torqmatic torque converter, showing the hydraulic retarder used in braking.

Courtesy of Kenworth Motor Truck Co.

A 36-ton rear-dump truck powered by a 400-hp. diesel engine.

Courtesy of Mack Trucks, Inc.

A ten-wheel tandem axle rear-dump truck of greater capacity.

Courtesy of Oshkosh Motors

A 34-ton side-dump trailer with a 356-hp. LPG (liquified petroleum gas) engine.

A 50-ton bottom-dump tractor-trailer with a 300-hp. diesel engine.

Courtesy of Dart Truck Company

A 34-ton rear-dump with a twin-engine of 436 total hp.

Courtesy of Euclid Div. GMC

employed on large tractor-trailer coal haulers. In one 60-cu. ft. unit, 64 wear points are being lubricated automatically.

Conveyors—Since the design and operation of this type of equipment is generally familiar, not too much need be said about them here. Main improvements are in belt life due to the belt material, the support roller bearing design, and drive systems.

Large electric motors and gear reduction units provide motive power to the drive wheel. The intermediate sections are merely a repetition of the support rollers. These are usually arranged in a trough shape.

Sealed bearings are used on some of the support rollers, and automatic lubricators are employed at some locations.

Processing Equipment Due to the great variety of equipment in use, only screens, crushers, and ball and rod mills will be discussed since they are the most common to all operations. Conveyors are also used extensively, but these have already been discussed.

Screens—Screens or "grizzlies," as wide-mesh ones are called, are used to classify material by size, both as it enters the processing plant and between the many successive steps.

Shaking and vibrating screens are rectangular screens mounted on a slope, which either shake or vibrate the material from the high to the low end. Some designs use several layers of screen, lower screens having smaller openings than the uppermost ones; other use only one screen with several zones of different hole size. The screening surfaces are made of either perforated plates, heavy steel bars, or woven wire, depending on the weight and size of the material they must handle. Screens are vibrated mechanically, through eccentric cams operated by an electric motor, or by an unbalanced flywheel. The screens are mounted so that the vibrations are not transmitted to the structure housing them. Wash sprays are often used during the screening operation.

Rotary screens, used for lighter work, consist of horizontally mounted concentric cylinders made of mesh or perforated plate of various sizes, the inner-cylinder openings being larger than those of the outer. Large electric motors and reduction gears drive the drums.

Crushers—Together with screens, these are the most common pieces of equipment in mine processing work. A differentiation is generally made between primary and secondary crushers, the former handling the material as it comes from the pit and the latter reducing the output of the primaries still further.

Jaw crushers are relatively simple and rugged. Ore or stone drops between two jaws arranged in a V-shape that is open at the bottom. One jaw is fixed and the other moves toward it repeatedly, thereby crushing material between them. Motion is imparted to the movable jaw by a belt-driven eccentric shaft from which the jaw swings. With successive strokes the smaller pieces drop down slightly toward the apex of the V and are reduced further until they fall out the bottom. Changes made have been toward larger sizes, with harder removable jaw linings. Sizes with as large as 84- by 60-in. openings are in use.

Gyratory crushers are machines having a driven rotating member that is roughly conical in shape. This driven member oscillates around a vertical axis and thereby crushes material that is flowing down its sides against a surrounding fixed cone of similar shape. The motion of the cone either describes a small circle about the vertical centerline or else only the upper part moves in a circle; this motion being much like the wobble of a little boy's top as it starts to lose speed. The fixed heads have either spring or hydraulic relief systems to prevent jamming by oversize pieces or tramp iron.

The moving cone is mounted on an eccentric that is driven through bevel gearing by a belt-powered shaft and pulley. Full pressure oil lubrication of bearings, gears, and other sliding surfaces is commonly provided by an internal pump.

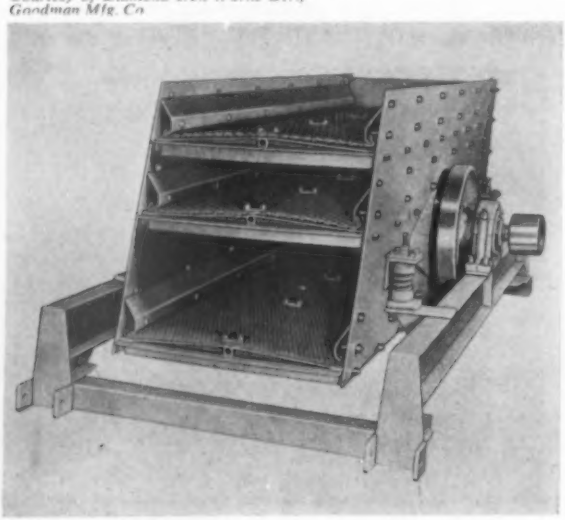
Sizes up to 12-in. intake throat diameter are available. Emphasis in design has been on harder crushing ring sections of alloy or manganese steel, improved bearing arrangement to withstand shock and reduce wear, and methods of adjusting clearances to maintain a constant size product.

Ball and Rod Mills—These are used after the crushing stages when it is desired to reduce the material to a fine powder. Input material is generally in the order of ¾ in.

The units consist of horizontally-mounted rotating cylinders with either a large number of free-falling balls or longitudinal rods on the interior. The material is mixed with the balls or rods and crushed by grinding action between them.

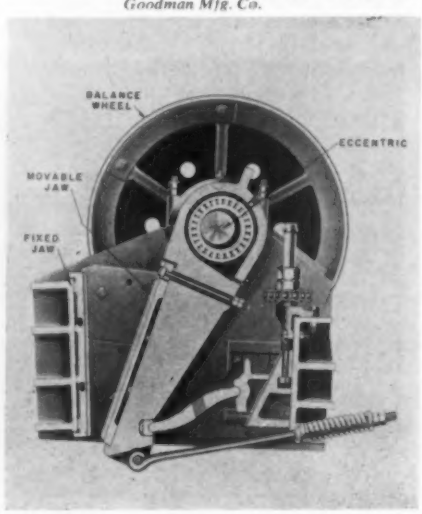
The drums are rotated through a large external ring gear on the drum

Courtesy of Diamond Iron Works Div., Goodman Mfg. Co.



Left: One type of 3-deck, vibrating screen.

Courtesy of Diamond Iron Works Div., Goodman Mfg. Co.



Right: A sectional view of a jaw crusher, showing the V-shaped opening between the two jaws, and the eccentric shaft.

"We've had starts in below-zero weather —and never any trouble"

McElroy-Wilken
Kalispell, Montana

One of the things Floyd McElroy and Fred Wilken like most about the CAT* No. 955 Traxcavator is its cold-weather starting. "We've had starts in below-zero weather and never had any trouble," they say.

Producing ready-mix concrete and digging basements under contract, they were using separate machines for loading and excavating in 1955. Then they bought the Traxcavator*. "We chose a No. 955 because Caterpillar makes the best machines on the market," both agree. "They're heavier built and have a reputation for standing up better."

Wally Buck, operator of the Traxcavator, says: "The No. 955 handles both the loading and excavating jobs a lot faster. It works circles around competitive machines." He's loading gravel from a stockpile in the photograph shown above.

The No. 955 is one of three Cat-built Traxcavators. Its bucket capacity is 1½ cu. yd. with 70 HP. The smaller No. 933 (1 cu. yd., 50 HP) and the larger No. 977 (2¼ cu. yd., 100 HP) complete the line.

All three are designed from the ground up as excavating and loading machines. And all have these advanced features: 40-degree bucket tilt-back at ground level for more leverage, less spillage. High reach without strain. Long-lasting oil clutch. Convenient controls. "Built-in" operator comfort.

Your Caterpillar Dealer will gladly give you a demonstration on your job. And you can count on him to protect your investment with reliable parts and service.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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WANTED— THE HARD WORK

by enclosed motor-driven reduction gears. Trunnion bearings are of the plain journal type, with either oil pressure flotation systems or grease lubrication. Improved bearing design and liner material are being used.

LUBRICATION

It is virtually impossible to overemphasize the vital part which lubricants play in keeping an industry as highly mechanized as surface mining operating at peak efficiency. This is especially true when one considers that the environmental and operating conditions are inherently among the most adverse that can be found. Extreme dust and mud, wide variations in weather and temperature, heavy shock loads, and 24-hour operation of much of the equipment all place severe demands on the lubricants used. Haulage equipment in particular, operates chiefly between the extremes of idling and full-throttle, full-load operation.

Quality lubricants have been developed by the lubricant manufacturers in co-operation with the mining and equipment industries. These can fully protect moving parts under the severe conditions encountered in this service. In order to do their job, however, they must be applied to the right places in the right quantity and at the right time. To do this requires a systematic lubrication program. In addition, if optimum equipment life is to be obtained, this must be coupled with sound preventive maintenance and overhaul practices.

The cost of good lubrication is almost negligible in relation to the value of the equipment being protected. Trucks alone cost from $30,000 to $80,000 apiece, and electric shovels vary from $150,000 to $2,600,000. Down time is also very costly on a round-the-clock operation of this sort. In view of these factors, it is evident that to compromise with lubricant quality is foolish economy.

Fortunately, open-pit mine operators generally are giving proper emphasis to the above considerations. Trucks are serviced and checked each shift, and regular oil drain and filter change periods are followed. Equipment such as tractors, drilling rigs, and shovels that remain outdoors are greased daily by the assistant operator or oiler. In most mines the electrical motors on all equipment are under the jurisdiction of the electrical shop men, who lubricate these on a separate schedule. Indoor equipment is greased and oiled daily, where required, by a crew of oilers.

Automatic lubricators are coming into increased usage both in and out of doors in an effort to eliminate the human element and achieve controlled lubrication.

A definite trend is also evident toward a reduction in the total number of lubricants used. Consolidation where possible is very desirable, consistent, of course, with maintenance of adequate lubrication. It simplifies stocking and handling problems and facilitates putting into effect a planned lubrication program. To handle too many lubricants causes confusion, possible misapplication, and waste. The savings effected through consolidation more than justify the use of premium grade lubricants where necessary. These afford superior protection and retain their effectiveness for a much longer period of time, thereby also adding to savings.

Simplified Lubrication Plan Although the basic units vary considerably in design and function, they are made up of many similar parts from a lubrication standpoint. Considerable experience with lubrication of equipment of this type both in the mining and heavy construction fields has shown that the majority of lubrication requirements can be handled by the basic lubricant types shown in the accompanying chart. These lubricants are listed together with suggested safe lubrication intervals for each of the components they are designed to lubricate.

The plan suggested in the chart is not inflexible. Where unusual conditions dictate, alternate types of products can be (and are) employed. For example, high-tempera-

SIMPLIFIED LUBRICATION PLAN FOR SURFACE MINING EXCAVATING AND HAULING EQUIPMENT

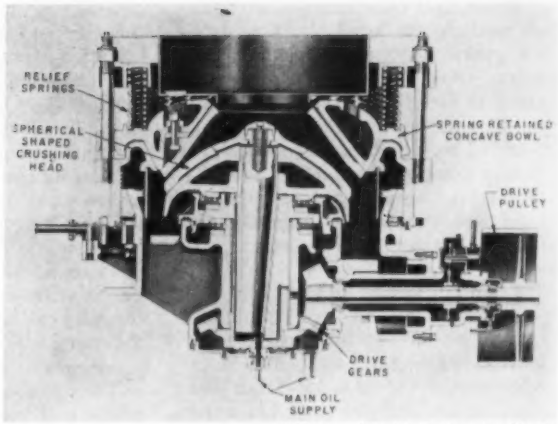
Part Requiring Lubrication	*Lubrication Interval, Hours*	*Lubricant Type Used** 90-32°F.	32-10°F.
Engines—Gasoline, LPG and Diesel**	100	Heavy Duty Engine Oil	
Engine Accessories—Oil Lubricated	100	SAE 30	SAE 20-20W
Oil can points—Moderate loads	As required		
Railroad Diesel Engines	6000	Railway Diesel Oil	SAE 40
Railway Journal Bearings—Waste Packed	Keep at proper level	Premium Grade Car Oil	
Gear Boxes—Transmissions, Differentials	1000		
Chain Drives	100	Extreme Pressure Gear	
Flexible Couplings	1000	Lubricant	
Universal Joints	1000	SAE-140	SAE-90
Other Oil Lubricated Parts—Severe Loads	10		
Hydraulic Mechanisms (Except fluid transmissions)	1000		
Air Compressors —		Premium Grade Hydraulic Oil	
Reciprocating and Rotary	200	SAE-30	SAE-10W
Electric Motors and Generators Oil Lubricated	1000		
Percussion-Type Rock Drills, Air Line Lubricators	Hand Applied—Hourly Oilers—As required	Extreme Pressure Rock Drill Lubricant	
Grease Fittings —			
Linkages, Plain Bearings, etc.	10		
Ball and Roller Bearings	100	Multipurpose Heavy Duty	
Hand-Packed Bearings***	100	Grease No. 2	
Wheel Bearings	1000		
Track Rollers	10	Track Roll Lubricant	
Exposed Gears	As required		
Railroad Traction Motor Gears	As required	Adhesive Type Gear Lubricant	
Wire Ropes and Cables	As required		

* Where standard SAE or NLGI viscosity and consistency specifications apply, they are shown for each temperature range. In other cases lubricant supplier should be consulted for proper grade.
** Except railroad diesel engines.
*** Except railroad journal roller bearings.

ture greases are used in electrical equipment bearings or in support bearings for shovel and dragline cable drum brakes, if high ambient temperatures develop. Also, extremely low temperatures such as those occurring in Minnesota's Iron Range occasionally demand use of lower viscosity oils and softer consistency greases than those listed. Torque converters and hydraulic couplings are not shown in the chart due to the wide variation in lubrication requirements for the many types in use, which makes it impossible to give a blanket recommendation. Many other specialty products such as transformer oils, railroad journal roller bearing and traction motor greases, gel-type filter oils, water pump grease, and thread lubricant are used in surface mining. Those given in this chart, however, cover the majority of uses, particularly in that area where the greatest overlapping of equipment manufacturers' recommendations occurs.

Engine Oils (Heavy Duty)—Engine oils of the heavy-duty type protect against wear, rust, and corrosion, and have detergent-dispersant characteristics to hold combustion products in suspension. In addition, they are non-corrosive to bearing materials and resist foam and oxidation. The requirements of the majority of engines in use are satisfied by an oil of this type meeting Military Specification MIL-O-2014A. Where an engine manufacturer specifies that his equipment requires an oil of higher detergency level such as a "Supplement 1," "Series 2" or "Series 3" oil, the oil supplier should be consulted, so as to provide a product meeting these requirements.

Railway Diesel Oils—Railway diesel engines pose a different problem in the balancing of additives to give the desired properties listed above, and crankcase oils specially developed for this equipment are recommended. Compatability with and lubrication of both copper-lead and silver bearings is a major consideration. In addition, the engine builders have certain requirements which must be met before they will approve the use of a given oil in their equipment.



This cut-away view of a gyratory crusher shows how its parts function.

Courtesy of Smith Engineering Works

Gear Oils (EP Type)—Although straight mineral oils can handle the loads developed in some gear cases, hypoid and worm gears demand an oil that has oiliness and extreme pressure additives. Since EP oils also protect against the harmful effects of shock loading and misalignment and resist foaming and oxidation, it is wise to use them in all gear boxes. These oils should be non-corrosive to system components. Oils containing lead-naphthenate are included in this category.

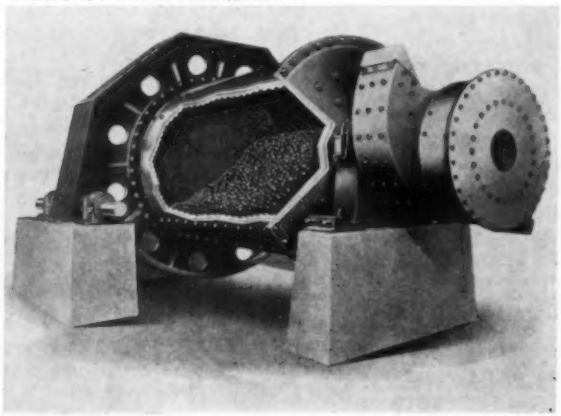
Gear Oils (Adhesive Type)—These very adhesive products contain special additives providing resistance to water action. They resist being thrown off by centrifugal force and form a tough cushion between mating parts. Cutback versions are available for ease of application, in which solvents that are incorporated evaporate after they are brushed or sprayed on. Their ability to penetrate and displace water also makes them ideal as wire rope lubricants, since they seal each strand in a tough film preventing rusting and fraying.

Hydraulic Oils (Premium Grade)—In addition to acting as a physical medium for transmitting power, hydraulic oils lubricate pumps, cylinders, and other system components. Premium oils are fortified to prevent wear and rust and to resist oxidation, sludging, and foaming.

Rock Drill Lubricants (EP Type)—These specially compounded lubricants atomize readily for uniform distribution in air lines. Their adhesive and EP characteristics enable them to plate-out on wear surfaces, protecting against severe loads. Their rust preventive action is very important in view of the high moisture normally found in air systems.

Multiple-Purpose Heavy-Duty Greases—These are generally lithium base products with high dropping points. They should have an oil sufficiently heavy to withstand heavy wheel bearing loads. The grease must resist water contamination, resist shear breakdown, and have good low temperature pumpability. The term multi-purpose covers a great deal of territory. The integrity and reputation of the lubricant supplier are the best assurance the user has that a given grease meets all these stringent requirements. If there is any doubt that a given product can handle all the grease lubrication jobs shown in the table, it is best to use a separate grease for wheel bearing lubrication since this is the most critical requirement.

Courtesy of Allis-Chalmers Mfg. Co.



A cut-away view of a ball mill.

Track Roll Lubricants—Two types of product are available. One is a soft grease designed for use in track rollers using roller bearings and metal-to-metal seals. It needs to have good oxidation and mechanical stability. The other is a semi-fluid stringy compound which is used in lubricating the plain bearing type. It must flow out of the seals slightly, thereby sealing against dirt and water.

Premium Grade Railway Car Oils—Requirements for the minimum quality of car oils for waste-packed journal bearings are set forth in AAR Specification M 906-55. High viscosity index and low pour point are primary requisites.

In addition to the above characteristics, premium grade car oils have oiliness, extreme pressure additives, and improved oxidation stability. These factors are particularly advantageous in mining use, where speeds are low and conditions in the journals are in the boundry lubrication zone much of the time. The higher loads carried by ore cars also require the added protection afforded by a fortified oil.

Lubricants for Processing Equipment Indoor processing equipment has lubricated bearings, chain or gear drives, and cables as the chief components requiring lubrication. The necessary lubricant types required for each of these components have already been described in the previous section on excavating and hauling equipment, and the same general lubricant requirements hold. Lubrication intervals shown in the table no longer apply, however, and longer relubrication intervals are usually used. Also, additional viscosity grades of both the hydraulic oils and the EP gear lubricants are necessary, the particular grade employed depending on the equipment involved.

The multipurpose grease described before will again handle most of the grease lubrication requirements of the processing equipment. However, specific grades of medium dropping point grease can be used if desired, and extreme pressure greases may be employed where unusual conditions of load or temperature make it mandatory.

It is impossible to generalize on the application of these lubricants because of the great range in design and size of equipment used in the processing operations.

Storage and Handling of Lubricants No discussion of lubricants can be complete without emphasizing the importance of careful storage and handling of lubricants. Even the finest lubricant cannot do its job if allowed to become contaminated. Contaminated lubricants must generally be discarded, resulting in a source of waste. Improper application also results in needless waste. It is estimated that coal strip mines alone will consume $6,300,000 of petroleum products in 1957. While a major portion of this represents fuel, it can be seen that even a small percentage of waste can amount to a sizable sum.

Lubricants should be stored indoors, preferably in a separate oil house with some one responsible for issuing them. Where they must be stored outdoors, oil and grease drums should never be left with bungs out or lids off, since this invites contamination. Drums should be stored on their sides and be equipped with faucets unless a dispensing pump is available. This prevents water from seeping into the drum.

When using lubricant guns or pumps, care should be taken to wipe off fittings and filler plugs before the lubricant is introduced. Where parts work in dirt, such as the pins of track treads and drag line cables, care should be taken to follow the general recommendation of machinery builders that no lubricant be applied.

In cold weather operation, lubricants should be stored in a warm place. If they must be heated, the drum or dispenser should not be placed so close to the heat source as to scald the lubricant. This can be particularly serious in the case of greases, causing separation or change in consistency.

SUMMARY

The equipment used in open pit mining and quarrying operations has grown to unprecedented size in recent years. Many of the largest self-propelled land-machines in existence are being used in surface mining. The enormous quantity of materials moved each year no longer makes "moving mountains" a measure of the impossible.

Expanded production of iron, coal, and other minerals has kept pace with and helped spark the postwar growth of the American economy. The aggregate industry has been straining to keep up with the demands of the building industry, and it is now in the midst of supplying the tremendous quantities of material required by the Federal Road Building Program.

Equipment builders and mine operators are to be congratulated on their quickness to adapt new developments in power and materials to their needs. The lubricant suppliers take just pride in this growth by developing superior lubricants to keep the equipment functioning smoothly and economically.

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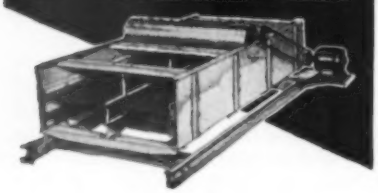

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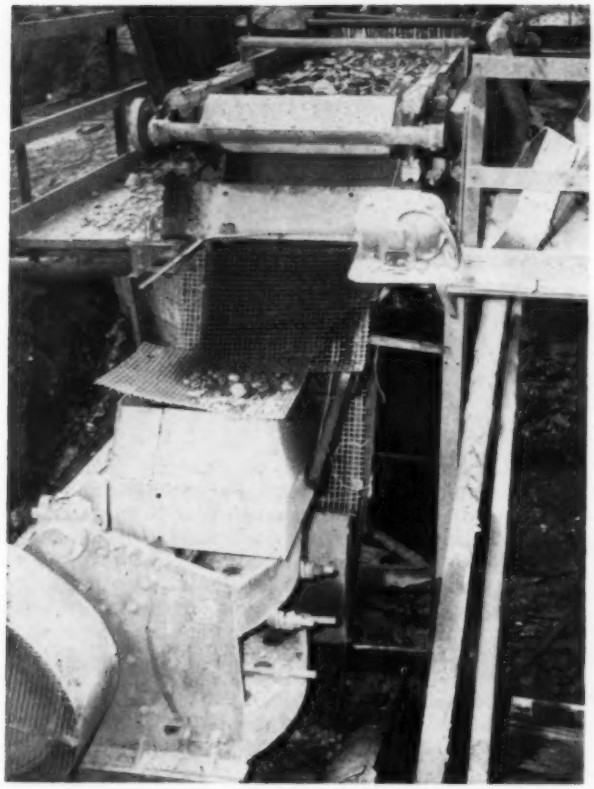
Saskatchewan Cement Co. Names Executive Officers

The Saskatchewan Cement Company, Ltd., of Canada has announced the appointment of George R. Whitmore as chairman of the board and William S. Ziegler, executive vice-president of Inland Cement Company, Ltd., Edmonton, Alta., as president.

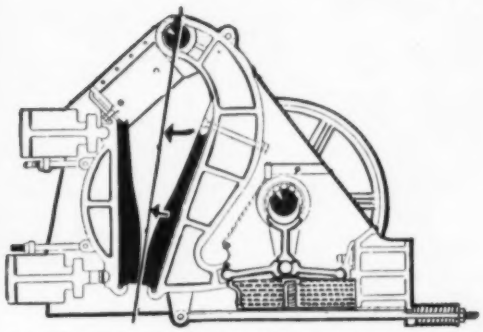
Other officers are George Ross, former sales manager for Inland Cement, vice-president, and Edward Judd, former financial officer for Saskatchewan and Inland, secretary-treasurer.

Gypsum Lime and Alabastine, Canada, Ltd., Toronto, Ont., reported net earnings of $1,408,000 or $1.60 per share for the 9 months ended August 31, 1957. Earnings for the 1956 comparable period were $1,472,346 or $1.67 a share.



57,000 tons of hard rock crushed by single set of KUE-KEN® CRUSHER jaw plates

. . . same hard rock that wore out jaw plates of previous crusher in 10 days!



Jaw plates last at least 5 times longer . . . only Kue-Ken crushes without rubbing.

See how the hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing

The rock plant of Rice Bros., Clements, Calif. produces 125 tph concrete aggregates, 200 tph road base material and 125 tph plant mix. It supplies all the aggregates for their ready-mix plant in neighboring Lodi where a fleet of transit mix trucks give quick delivery of materials. With 60% of the rock plant output going through the jaw crusher, any shutdown of the crusher would be extremely costly. By changing to Kue-Ken crusher, jaw plate replacement as often as from 4 to 10 days has been greatly reduced. The long jaw plate life of Kue-Ken comes from crushing without rubbing. Abrasion, the main cause of jaw plate wear with ordinary crushers, is eliminated in Kue-Ken. The sealed and lubricated toggle mechanism is practically maintenance free. On overload or tramp iron, the flywheel is automatically released avoiding breakage. It can be quickly reset.

Table of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position.

Table is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed.

Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

WRITE FOR CATALOG

KUE-KEN® CRUSHERS

"CRUSHING WITHOUT RUBBING"

STRAUB MFG. CO., INC. 8386 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

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DENVER, COLO. . . . . Union Supply Co.
CASPER, WYOMING . . . . Moss Equipment & Supply Co.
VANCOUVER, B. C. . . . . Universal Equipment Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

design flexibility

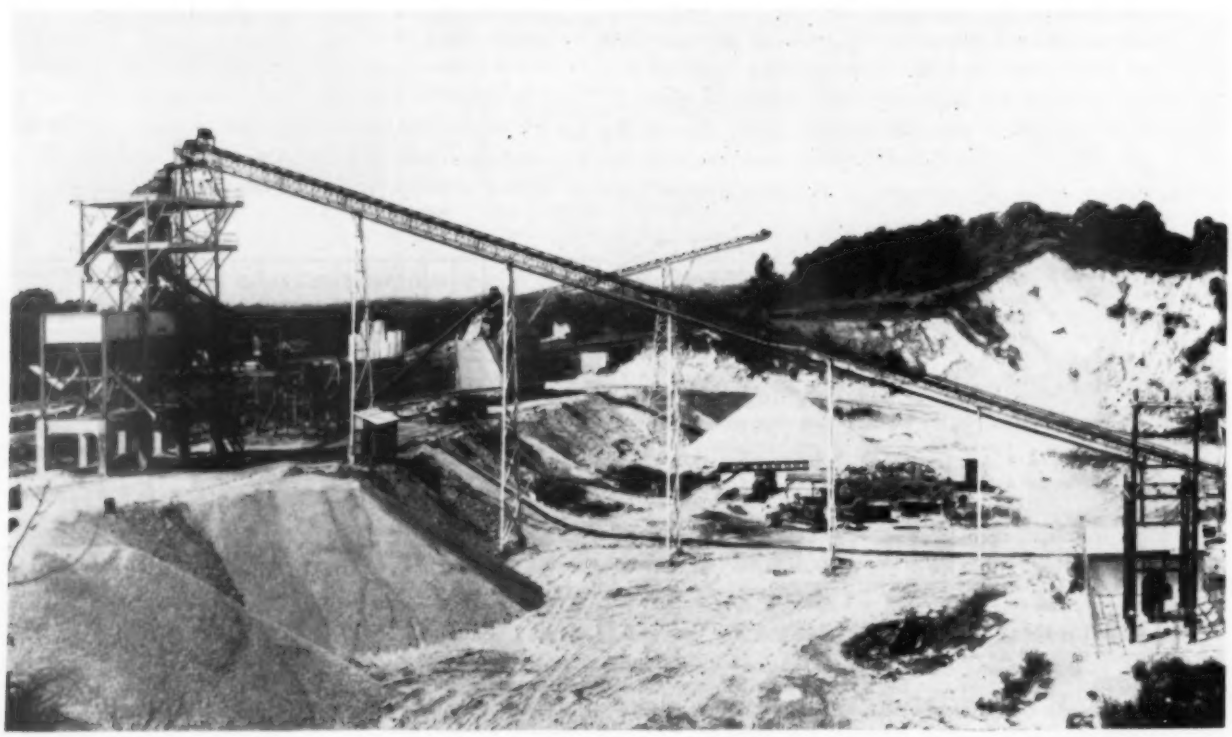
with an eye to the future

MODERN plant design in the pit-and-quarry industries calls for incorporation of a high degree of production flexibility, as well as provision for future expansion at the minimum of inconvenience or realignment of flow and equipment. Both of these factors are well exemplified in the new 200-cu. yd. per hour sand and gravel plant recently built and placed in operation near North Lake, Wis., by the State Sand and Gravel Company of Milwaukee.

In fact, due to the careful planning relating to the future expansion factor, the above capacity figure is actually misleading. That rate could be more than doubled—to 425 cu. yd. per hour—in a very short time. All that would be re-

By **BUREN C. HEROD**

Abandoned for about 20 years, this site of a former sand and gravel operation has undergone a striking transformation with the construction of State Sand and Gravel's modern plant at North Lake, Wis. The new pit is now being extended to the north (right) of the old pit, and a part of the latter is being utilized for stockpiling (left).



quired in expanding to the latter capacity would be a duplicate pair of screens in parallel with those now on the washing plant; another screw classifier, should sand show up in greater quantity in the pit than is now being encountered; and perhaps a tertiary crusher. Both space and structural provisions for these potential additions are incorporated in the present lay-out.

Market The new plant was built in order to produce a greater quantity of aggregates required by the firm's four owned or associated ready-mix concerte facilities, and also to ensure a firm place in the highly competitive commercial aggregate market in the Milwaukee area. Until this year, the 30-year old Burleigh pit and stationary plant near Brookfield, and portable units, had been the sources of open market and ready-mixed concrete aggregates. The 150-t.p.h. Burleigh facility was hard-pressed to meet constantly increasing construction demands, and as a consequence, initial planning for a second stationary operation was under taken in 1956.

This view from the loading tracks shows the detail of the screen and loading bin installation, and the sand processing equipment. The latter has the capacity to handle substantially more finer material than is currently being encountered.

State Sand and Gravel enhances competitive position with modern plant

Planning As described by Albert A. Retzlaff, founder and president of the company, the new North Lake plant is the "brainchild" of his son W. A. (Bill) Retzlaff, who is secretary-treasurer and general plant manager. The latter developed a basic plan for the new operation, as well as the complete design of the power and fully-interlocked control system, in which all conduit is intalled underground. Another son, R. C. (Dick) Retzlaff, assistant secretary, supervised construction of the entire plant. A third son, R. F. (Bob) Retzlaff, vice-president and sales manager, handles all material sales, both ready-mix and bulk materials.

The first step toward development of this operation was taken about four years ago, when the company acquired the North Lake site of a former sand and gravel operation. This property had been dormant for about 20 years. During the summer of 1956 it was decided to obtain bids on detailed plant design around Bill Retzlaff's basic plan. On the basis of a preliminary design, the Smith Engineering Works, Milwau-

kee, who had earlier recommended aerial and contour surveys as preliminary to undertaking the project, was awarded the contract.

Detailed drawings were started last fall, and from that time until completion of the plant about two months ago, close liaison between the construction project and the Smith organization was maintained by H. H. Schaper, assistant sales manager of the latter company. As noted previously, Dick Retzlaff, who is also superintendent of the new plant, headed the local crew in its construction, which started last spring.

The plant site and pit are contained in a tract of about 200 acres that adjoins the mainline of the Chicago and Northwestern Railroad. Testing has shown the deposit to have at least 110 ft. of sand and gravel down to the water table, and also a substantial thickness below that level. While original estimates indicated that the pit-run material would have 50-50 proportions of plus and minus ¼-in. sizes, analyses of raw feed during the first weeks of operation have shown a 3-to-1 ratio of the larger material to the smaller. The top size, of which there is only a nominal amount, runs to a maximum of 10 in.

Plant and Equipment Primary components of the plant, including the washing and screening tower, classifier, and loading bins, were erected on a narrow strip of the property between the old pit on the north and the railroad and property line on the south. The new pit operations were started directly opposite the plant site in the north bank of the old diggings. Primary and secondary crushers and scalping equipment are installed on the floor of the old pit. The latter, which has an elevation differential of about 20 ft. with the base of the washing plant, is approximately 105 ft. below the head pulley of the washing plant feed conveyor.

Major items of processing equipment in the flow are Telsmith units, with details shown in the table on p. 87. Allis-Chalmers motors are used throughout the plant, and an 8-in., 3000-g.p.m. pump of the same manufacture supplies processing water.

All conveyors in the operation, with one exception, were fabricated by the State crew, and all are chain-driven through Falk speed reducers. The washing plant feed conveyor (No. 3) was furnished by the Atlas Conveyor Company. Dimensions and other details appear in the table. All of the above conveyors are fitted with 5-ply belting except No. 6 and No. 7, both of which handle only sand and have 4-ply belts.

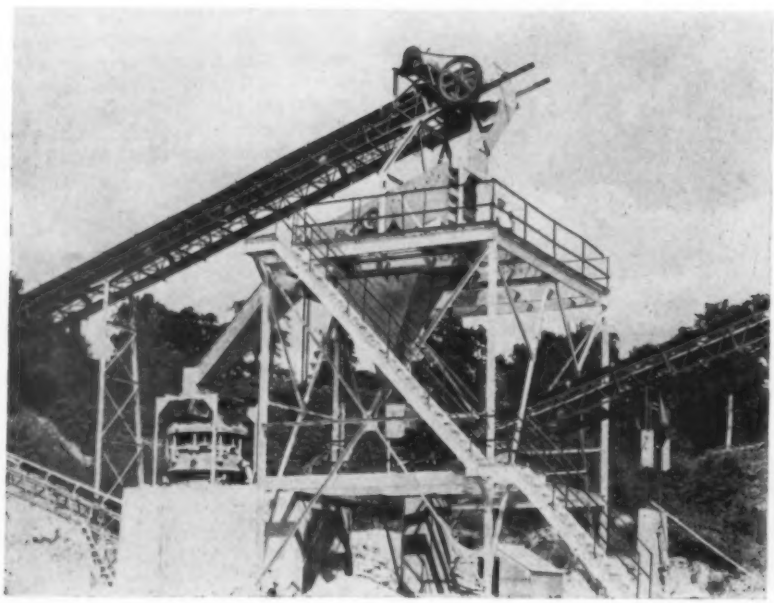
All parts of the plant are constructed of structural steel and are supported by concrete piers or foundations. The largest structure—the washing and screening tower—consists of a reinforced concrete column and beam substructure that supports a 3-unit model U-150 Butler steel bin. Above the latter is a steel 2-floor open superstructure in which the two washing screens are installed.

Both truck and rail shipments can be loaded through folding chutes from the above bins. Trucks are loaded on the north side, and a double chute system on the south side accommodates simultaneous loading of rail cars on two side tracks.

Another loading bin, that for sand, was adapted from a concrete bin structure on which the screening plant of the former operation had been mounted. This was expanded by the addition of steel side plates in providing a 1,200-ton storage, of which about 500 tons is live and available for loading through chutes to either trucks or the rail siding.

The power supply for the interlocked control system designed by

Left: Feed to the plant is initiated at this combined field hopper and primary jaw crusher installation. As the pit is advanced, field conveyors will be installed between the crusher and more distant loading points.



Primary crusher run is discharged over a scalper, top center. Plus 1½-in. material retained on the latter is chuted to the secondary crusher (left). The concrete base (left) will accommodate another crusher when product requirements or pit conditions call for additional capacity.

Bill Retzlaff is brought to the plant transformer at 26,000 v. and is stepped down to 440 v., which is furnished to all motors. The system can be controlled from either of two points—a panel installed on the washing and screening tower, and another panel in the transformer house. No interference with movement of vehicles or equipment is encountered from power drops since all electrical power supply lines are installed in underground conduit.

Flow The face of the pit now being worked was opened on the north side of the old diggings, which have cut into the side of a hill. It is currently planned to extend the pit straight north, and follow this up with excavation in the side areas at a later time. The nominal amount of cover now encountered is removed by a tractor with a dozer blade.

A Manitowoc Speed Crane rigged as a dragline and equipped with a 2½-cu. yd. bucket is used for digging. At present, the dragline is operating on a 90- to 100-ft. face, within reach of a field hopper above the primary crusher (see accompanying pit photograph). As the pit is advanced, field conveyors will be added between this crushing station and the more distant loading points. Ultimately, an 8,000-ton surgepile will be created from the primary crusher discharge. A reclaiming tunnel below this pile will house drawpoints for feeding the material to conveyor No. 1 and thence to the secondary crusher.

The pit-run material received in the hopper is transferred by a 36- by 72-in. Syntron feeder to the primary jaw crusher. Reduced through a 5-in. setting, the feed is chuted to conveyor No. 1 for transfer to the scalper. Only one deck of this 2-deck unit is now fitted with screencloth—of 1½-in. square opening perforated plate—and the fraction retained is chuted to the secondary crusher.

At such time as a possible change in the characteristics of the deposit may be encountered, or a greater production of specific sizes may be desired, another deck will be fitted on the scalper, and that retained fraction will be chuted to a third crusher. The concrete base on which the secondary crusher is mounted will readily accommodate the addition of another such unit.

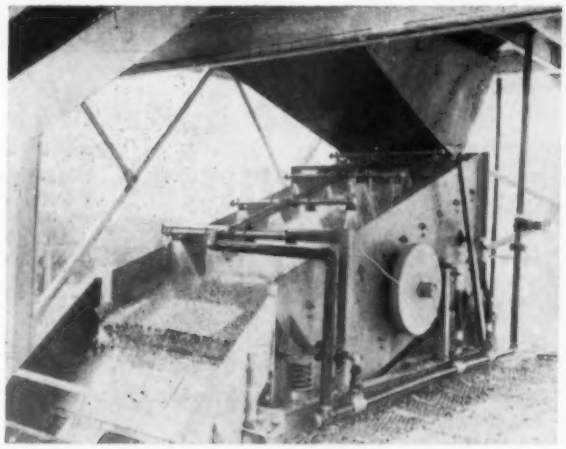
Discharge from the secondary crusher is returned on conveyor No. 2 to conveyor No. 1 in closing the scalping and crushing circuit. The minus 1½-in. fraction passing the scalper is chuted to conveyor No. 3, on which it is carried up out of the

EQUIPMENT DATA

Unit	Type	Motor
Crushers:		
primary	18- by 32-in. jaw	60 hp. (1,200 r.p.m.)
secondary	48S Gyrasphere	125 hp. (900 r.p.m.)
Screens:		
scalper	5- by 14-ft. Vibro-King	10 hp.
washing	(2) 5- by 12-ft. Vibro-King	10 hp.
Classifying:		
scalping tank	10- by 28-ft.	
classifier	30-in. by 25-ft. twin screw	10 hp. (2)

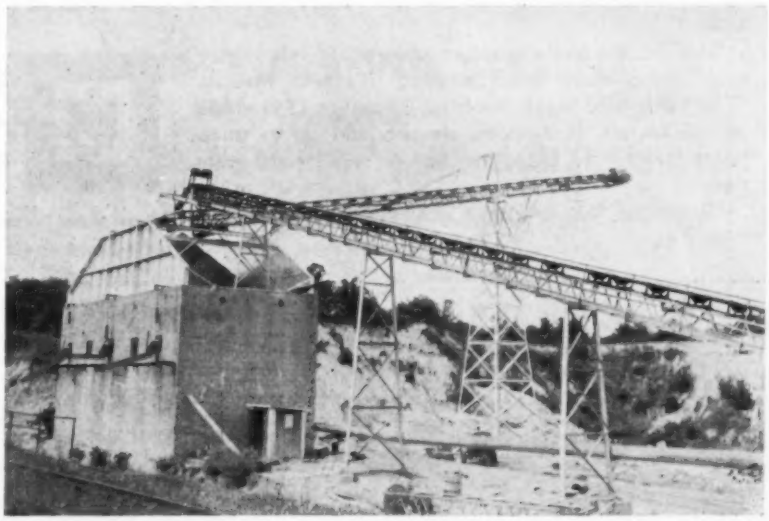
CONVEYOR DATA

No.	Length (O.C.)	Width	Motor	Capacity
1	138 ft. 6 in.	36 in.	50 hp.	425 cu. yd. hr.
2	82 ft. 9 in.	24	10	180
3	290	30	60	425
4	89	30	10	300
5	42	30	10	300
6	152	24	20	180
7	125	24	20	180



The lower of the two washing and finishing screens. Structural and space provisions have been made for the installation of two more screens, parallel to those now in operation.

The lone holdover from the former plant at North Lake was this concrete bin structure. It has been modified with steel side plates and top, and is used as the sand loading bin. When this storage is full, the conveyor, foreground, discharges the sand from the classifier to the stockpiling conveyor, background, that feeds a stockpile on the old pit floor.



Out of the pit with 18-tons of shovel-loaded limestone comes the "65" Payhauler owned by Lee Crawford Quarry Co., Cedar Rapids, Iowa. The 1,200-foot haul includes a 400-foot 15% grade. The "65" was chosen on competitive demonstration.

"65" Payhauler® beats two competitors on tough, 50-hour demonstration

—for Lee Crawford Quarry Co., Cedar Rapids, Iowa

Veteran quarryman Lee Crawford invited three makes of off-highway haulers to go into his pit and "roll up their sleeves." He wanted hauling that could match the crushing efficiency of his newly-equipped plant which is as nearly perfect as could be built.

One make of hauler could not match crusher capacity. Another kept the monkey wrenches busy. Winner of the 50-hour test: the International "65" Payhauler!

"Perfect Payhauler performance made our choice easy," states Plant Superintendent Kenneth Mercer. "The '65' hauled bigger loads easily up the 15% grade out of the pit. It dumped cleaner, and up to three times faster—and got away faster for shortest cycle time.

"With the '65,' we have achieved our plant efficiency goal."

Try the exclusive high reverse and "zip-around" power steering—that give 18-ton "65" or 24-ton "95" regular pick-up truck spotting ease. Measure capacity-adding Payhauler get-away speed—and the fuel economy of its load-matched, turbo-charged diesel power. Measure super-fast Payhauler dumping speed. See your International Construction Equipment Distributor for a demonstration!

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

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Gentlemen: Please send me a free copy of the new, fully-illustrated Payhauler catalog (Form CR-603-G).

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pit to the top of the washing and screening plant.

The two screens in the latter are installed on the two separate decks of the plant's superstructure. The top screen, mounted directly above the lower, receives the full feed from conveyor No. 3. As noted earlier, both structural and space provisions are made for the addition of two more screens.

Both of the present units have two decks, each fitted with spray bars. The upper screen is equipped with ¾- and ⅜-in. opening woven wire screencloth on the upper and lower decks, respectively; while the corresponding decks on the lower screen have ¼- and 3/16-in. openings.

The 1½- by ¾-in. fraction retained on the top deck of the upper screen is chuted to one of the underlying bin compartments, while the material retained and passing the lower deck is chuted to the screen below. From the latter, the ¾- by ⅜-in. fraction retained on the top deck, and the pea gravel retained on the lower, are chuted to their respective bin compartments. Throughs from the lower screen are flumed to the water scalping tank near the base of the washing plant.

Dewatered sand is chuted from the scalping tank to the adjoining twin screw classifier. Since the proportion of minus ¼-in. material in the area of the pit now being worked is substantially less than anticipated, only one screw of the classifier (which has a dual drive) is required to handle the volume of sand now being processed.

Conveyor No. 6 receives the classifier discharge for transport to the sand bin described earlier. When this bin is full, conveyor No. 6 discharges through a flop gate onto conveyor No. 7, and the sand is carried out to drop on a pit floor stockpile that can accommodate about 55,000 cu. yd.

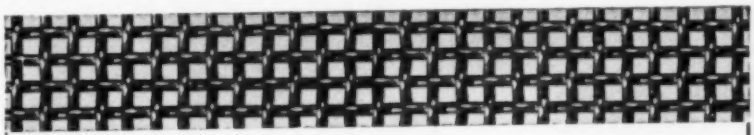
Water for the washing, scalping, and classifying phases is provided from a sump in the pit floor by an 8-in., 3,000-g.p.m. Allis-Chalmers pump. This capacity will meet the needs of future screening and classifying equipment, as well.

Although four basic products—three in the pea gravel to 1½-in. range, plus sand—have been made during initial operations of the last two months, the flow is flexible, and all local and state specifications can be readily met. Efficiency of operating design is evident in the fact that the plant is run by a crew of only three men under the foreman, Robert Gerbitz.

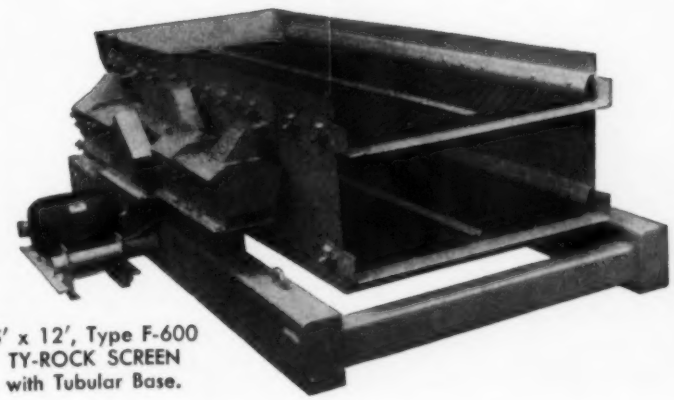
Truck and rail shipments originating from this location are delivered within a radius of 40 miles from the plant. In addition to the loading chute arrangement described previously in connection with the aggregate bins below the washing screens, a conveyor (No. 4) was installed under the washing plant bins after the plant went into production. Materials may be drawn individually from each of the three compartments, through clamshell gates, or may be drawn from two or all three at once in making a blend. These individual or blended products are discharged to conveyor No. 5 for loading on the outer one of the side tracks.

Plans have been made for an early installation of an automatic truck weighing system adjacent to the washing plant. Flow of material into the trucks, *via* the chutes on the aggregate bins, will be stopped by automatic control of the gates when a preset load has been reached, as indicated on a Fairbanks-Morse electronic axle load weighing unit.

A large proportion of the materials produced by this new facility and the older Burleigh plant is consumed in the production of ready-mixed concrete at the four central-mix plants operated by State and an associated firm. A fleet of about 70 mixer units are dispatched under



FOR PROFITABLE SCREENING
USE



5′ x 12′, Type F-600
TY-ROCK SCREEN
with Tubular Base.

TYLER VIBRATING SCREENS
AND
TYLER WOVEN WIRE SCREENS

There is a Tyler Vibrating Screen for every sizing and dewatering job. Tyler Screens are noted for the huge tonnages handled with top efficiency and low cost per ton.

Tyler Woven Wire Screens are made in all meshes and metals in over 10,000 different specifications. Ton-Cap and Ty-Rod Screens with the long-slot openings provide the greatest capacity for a given discharge area.

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

teletype and radio control from these locations.

In addition to those already noted, key personnel in the company's varied operations include Harry Schneider, superintendent of the long-established Burleigh pit; Claude Vorpahl, personnel manager; Gene Fiebrantz, office manager of the company's central office on Highway 45-100 in Milwaukee; and Ed Podgasky, garage superintendent, who heads vehicle maintenance. Al Brunner and Chet Champion handle all gravel and ready-mixed concrete dispatching operations.

Texas Portland Cement Co. Starts $3,800,000 Expansion

Capacity of the Texas Portland Cement Company's plant near Orange, Tex., which went into operation last April, will be enlarged by a $3,800,000 expansion, according to an announcement made by Kent D. Diehl, president. Cement output will be boosted from 2,000 bbl. daily to 5,000 bbl.

Included in the expansion will be a raw-grinding mill, a 400- by 11-ft., rotary kiln, a finish-grinding mill, six additional silos, and two blending tanks. These facilities, ordered from the Kennedy-Van Saun Manufacturing and Engineering Corporation, will be installed and ready to go into production by July 1, 1958.

In the first six months of operation the company's sales passed the $1,000,000 mark. Additional capacity is necessary to meet the mounting demand. The plant is currently running at full capacity.

Proof of Performance

The kiln illustrated is equipped with the Type F Recuperator. It presents conclusive proof of claims made for Recuperator performance, namely, rapid air quenching and cooling with immediate ignition of the fuel-air mixture at the tip of the burner pipe. It will also be observed that visibility inside the kiln is exceptional.

MANITOWOC SHIPBUILDING, INC.
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Appointments and Promotions

DONALD M. STEWART, a sales representative for the Zonolite Company, Chicago, Ill., has been named a plaster specialist for the firm's northern division and will devote most of his time to the Dayton-Cincinnati area. Mr. Stewart was an industrial salesman for Toledo Scale Company prior to joining Zonolite in 1954.

The following appointments have been announced by Cris Dobbins, president of the Ideal Cement Company, Denver, Colo.:

T. W. ROSEBAUGH, vice-president, has assumed the direction of business research, the central and research laboratory, and exploration. KENNETH E. PALMER will serve as manager of the central and research laboratory. GEORGE C. WILSNACK retired from his post as director of research on September 1.

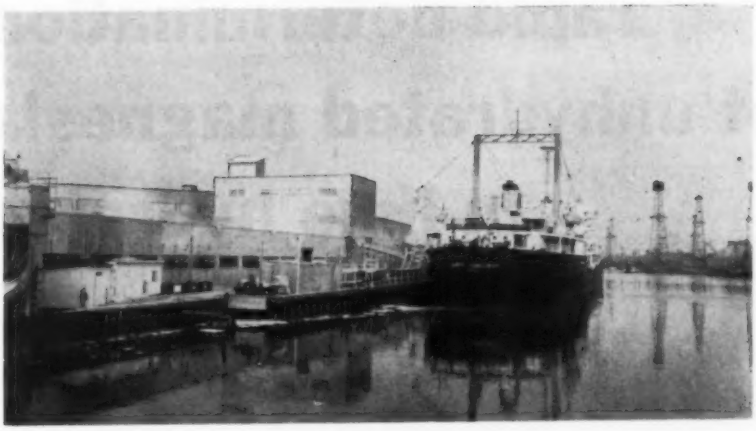
PETER S. HAAS has been elected vice-president and assistant general manager of the Permanente Steamship Corporation, a wholly-owned subsidiary of the Permanente Cement Company, Oakland, Calif. He will continue to serve as vice-president and assistant general manager of Permanente Cement Company.

Mr. Haas was formerly assistant works manager at the firm's plant at Permanente, Calif. He joined the company in 1947. In 1953 he was appointed assistant to the vice-president and general manager, and was elected vice-president in 1955.

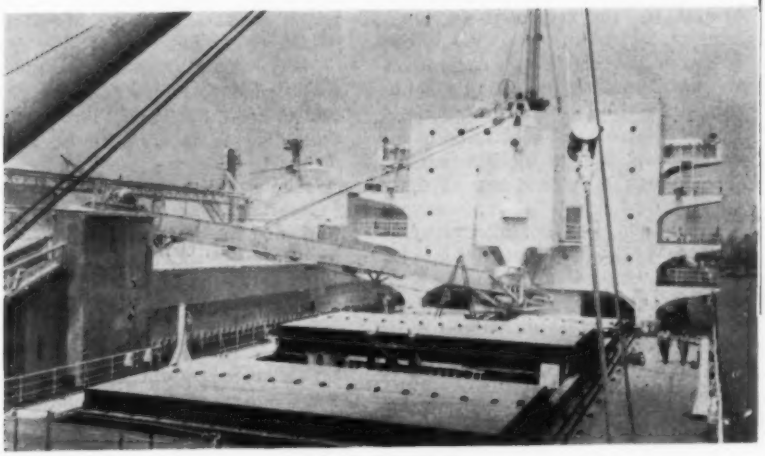
The Portland Cement Association, Chicago, Ill., has announced the appointment of JOHN D. HUCKSTEP JR. as manager of its advertising bureau.

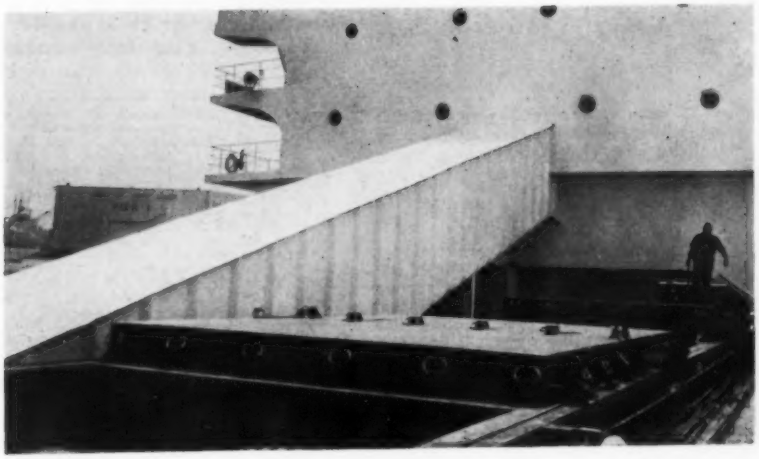
In his new position, Mr. Huckstep will direct P.C.A.'s national and local advertising programs. He was formerly media group supervisor on a number of national accounts for the Leo Burnett Co., Inc., Chicago.

17,000 Tons of Raw Gypsum Carried by New Self-Unloader



The new S.S. HARRY LUNDEBERG in port at Long Beach, Calif., with a cargo of raw gypsum for the Kaiser Gypsum Company plant (left). This self-unloader can unload, automatically, a 17,000-ton cargo in less than 15 hours.





ONE of the largest self-unloading bulk carriers on the Pacific coast went into service this year transporting crude gypsum from San Marcos Island in the Gulf of California to the plants of the Kaiser Gypsum Company at Long Beach, Calif., Antioch, Calif., and Seattle, Wash.

Tentatively named the *S. S. Kaiser Gypsum* during its trial runs, the new vessel was formally christened the *S. S. Harry Lundeberg* late in June, 1957, joining a smaller gypsum ore carrier of the same name which had formerly operated in this service (since renamed *S. S. Ocean Carrier*).

The new *Lundeberg* has a cargo-carrying capacity of 17,000 tons and is 525 ft. 4 in. in length. It was designed for Gypsum Carrier, Inc., a Kaiser Gypsum subsidiary, by the naval-architectural firm of George G. Sharp Company, New York, N. Y. Propelled by 8,500-hp. oil-fired steam turbines, the ship has a speed of 15 knots and is under the command of Captain M. W. Verran.

The minus 4-in. gypsum rock is loaded through quick-opening MacGregor-type hatches by a retractable shoreside boom conveyor at the San Marcos quarry wharf. Hold space is made up of two rows of self-trimming hoppers, each row served by a 36-in. by 396-ft. reclaiming belt-conveyor. Feed to the belts is by gravity through power-operated, horizontal track-type gates. At the forward end of the ship both conveyors discharge to an inclined belt-conveyor 48 in. wide which rises above decks, where the rock is again transferred, this time to a 48-in. by 78-ft. boom conveyor which carries the cargo over the side, delivering to a shore conveyor.

The new *Lundeberg* can load at a rate of 1,500 t.p.h. and can unload in excess of 1,000 t.p.h. Motors driving the conveyor belts are self-powered directly by the ship's own generators.

Above, left: This view shows the covered pivoted boom conveyor unloading to a hopper on the dock, which feeds the conveyor system leading to the storage structure.

Left: This inclined conveyor transfers the gypsum from the hold conveyors to the boom conveyor.

rapid determination of unhydrated magnesia in lime hydrates

A RAPID method for determining unhydrated magnesia, MgO, in dolomitic lime hydrate has been developed by E. Trattner of the National Bureau of Standards concreting materials laboratory.[1] The lime is treated with high-pressure steam, which results in complete hydration of the residual free MgO. The weight gain resulting from the forced hydration is taken as a measure of the unhydrated MgO in the sample. This method gives results which are reproducible and which agree well with those obtained by the costly and time-consuming chemical-analysis method previously required.

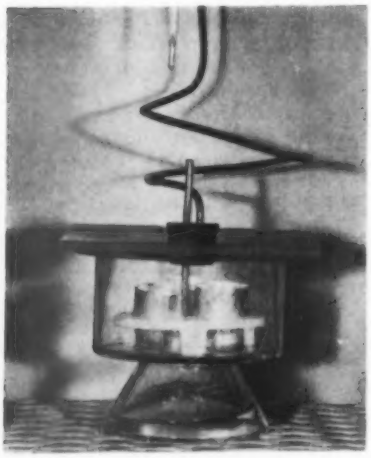
Hydrated lime produced in this country is either a high-calcium type which consists almost entirely of calcium hydroxide, or a dolomitic type which contains varying large proportions of magnesium hydroxide and magnesia. Since 1937, a series of investigations made by the Bureau have indicated that certain types of white-coat and plaster failures were caused by the presence of large amounts of unhydrated MgO in the dolomitic lime hydrate.[2] A limit on the unhydrated oxide content of hydrated limes was therefore suggested by the Bureau and subsequently incorporated into a specification by the American Society for Testing Materials.

A method for the determination of free MgO which does not involve detailed chemical analysis has been needed. Prospective purchasers of structural lime with no interest in its chemical composition aside from its unhydrated oxide content need a rapid and inexpensive test. Such a test should also be of great help in day-to-day control of the plant.

The standard chemical method for determining the unhydrated oxide content of hydrated lime depends on the assumption that the CaO is completely hydrated and the MgO only partially hydrated. The total amount of water determined in the analysis is sufficient to hydrate all the CaO and a part of the MgO. The remaining MgO is assumed to be unhydrated.

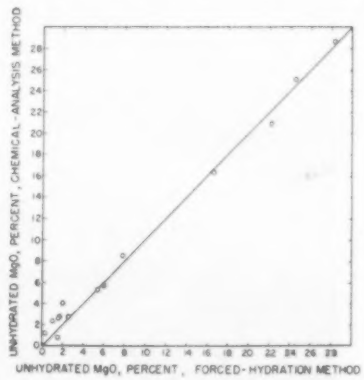
The test method developed by the Bureau involves the forced hydration of the unhydrated MgO by high-pressure steam in an autoclave. Each water molecule that the lime acquires during autoclaving results from the hydration of one molecule of free oxide. If the same assumption is made as in the standard chemical analysis method, namely, that the CaO is already completely hydrated, only the free MgO can be responsible for the gain in water. By determining this gain, the amount of free MgO can be easily derived.

To ascertain the water increment,



[1] [2] See references at the end of this article, p. 93.

Left: Carbon dioxide-free drying apparatus used at the National Bureau of Standards for drying lime.



Right: Relation between percentage of unhydrated MgO in dolomitic lime hydrate obtained by two methods at the National Bureau of Standards. The diagonal line illustrates the equality of results obtained by rapid forced hydration and chemical analysis.

the lime must be dried before and after hydration to the same degree of dryness. In addition, carbonation must be carefully avoided, since a weight gain due to carbon dioxide would lead to serious error. A CO_2-free drying apparatus of simple design was therefore developed. It consists of a small desiccator placed in an oven maintained at 120 deg. C. A hole in the desiccator cover is fitted with a two-holed rubber stopper. Compressed air is taken in through a reducing valve and passed through a train, consisting of a gas washing bottle containing concentrated sulphuric acid and a drying tower containing ascarite and magnesium perchlorate. The dry CO_2-free air then passes through copper tubing into the desiccator through one of the holes in the rubber stopper. The dessicator is vented through the other hole. Copper tubing coiled within the oven provides flexibility and easy manipulation of the apparatus.

The sample being investigated is dried in this apparatus, cooled, and weighed. It is then placed in an autoclave and subjected to saturated steam at a pressure of 295 p.s.i. for one hour. After a second drying it is cooled and weighed again. The increase in weight, which is the difference between the oven-dry weights before and after autoclaving, is assumed to be due entirely to the gain in water, and is multiplied by a conversion factor to obtain the weight of free MgO in the sample.

Duplicate tests were made by the forced-hydration method on 14 hydrated dolomitic lime samples. Comparative data were also obtained on the unhydrated MgO content of the same limes by the standard chemical-analysis method. No significant difference was noted between the free MgO values obtained by the two methods. However, the results obtained by the forced hydration method were reproducible with considerably greater precision than those obtained by the standard chemical-analysis method.

1. *A New and Rapid Method for Determining Unhydrated Magnesia in Dolomitic Lime Hydrates* by E. Trattner, A.S.T.M. Bull. (in press).

2. *Expansive Characteristics of Hydrated Limes*, NBS Tech. News Bull. 32, 105 (September, 1948); *Plaster Failures Resolved*, NBS Tech. Bull. 35, 74 (May, 1951); *Aging of Lime Putties*, NBS Tech. News Bull. 36, 139 (September, 1952). For further technical details see also *Hydration of Magnesia in Dolomitic Limes and Putties*, by L. S. Wells and K. Taylor, J. Research NBS 19, 215 (August, 1937) RP 1022; *Expansive Characteristics of Hydrated Limes and the Development of an Autoclave Test for Soundness*, by L. S. Wells, W. F. Clarke, and E. M. Levin, J. Research NBS 41, 179 (September, 1948) RP 1917; *Investigation of Failures of White-Coat Plaster*, by L. S. Wells, W. F. Clarke, E. S. Newman, and D. L. Bishop, BMS Report 121 (February, 1951).

Shipping Facility Opened By Permanente Cement On Long Beach Waterfront

Permanente Cement Company, Oakland, Calif., has begun operating the only deep-water cement shipping facility in southern California, at Long Beach, close to the gypsum products plant of Kaiser Gypsum, a wholly-owned subsidiary of Permanente.

Construction of docking facilities has been completed by Permanente, but installation of pumps and piping that will load and unload cement at a rate of 2,000 bbl. per hour is still in progress. Waterfront rights were granted by adjacent property owners.

The new facility has a three-fold aim: to serve as a cement distributor for the ready-mixed concrete and building material industries, to supplement production at the new Cushenbury plant in Lucerne Valley, southern California, by shipments from the northern California plant at Permanente, and to ship cement produced at Cushenbury to Hawaii and the market in the Pacific area.

The first shipment of cement arrived at Long Beach on September 14 from Cushenbury *via* the Santa Fe Railroad. The first sea shipment of 57,000 bbl. of cement to Hawaii left September 29 on the S. S. *Permanente Silverbow*, one of Permanente Steamship Corporation's two cement-carrying vessels. The other is the S. S. *Permanente Cement*.

Other deep-water shipping or receiving plants operated by Permanente are on San Francisco Bay, Calif.; and at Portland, Oreg.; Seattle and Pasco, Wash.; Anchorage, Alaska; and Honolulu, Hawaii.

Natl. Fire Protection Assn. Issues National Fire Codes

The National Fire Codes, a compilation of 168 fire safety standards as developed by the National Fire Protection Association, have just been published by the N.F.P.A. in a revised six-volume 1957 edition, according to Robert S. Moulton, technical secretary of the association.

The six new volumes by title and content are as follows:

Volume I — Flammable Liquids and Gases (35 standards, 896 pages)

Volume II — Combustible Solids, Dusts, Chemicals and Explosives (34 standards, 625 pages)

Volume III — Building Construction and Equipment (31 standards, plus an informative discussion of building codes and references to model codes, 736 pages)

Volume IV—Extinguishing Equipment (33 standards, 1088 pages)

Volume V—Electrical (The National Electrical Code, 1956 edition, including interpretations and interim amendments to July 30, 1957, plus six other N.F.P.A. electrical standards and a digest of the electrical provisions of 69 other N.F.P.A. standards, 704 pages)

Volume VI—Transportation and Miscellaneous (28 standards on air, marine, bus, and truck transportation and salvage, plus a comprehensive review of applicable government regulations, 672 pages)

The National Fire Codes, at $6 per volume, may be obtained from the Publications Department, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts.

Netzer Named Sales Manager Of Kaiser Sand & Gravel

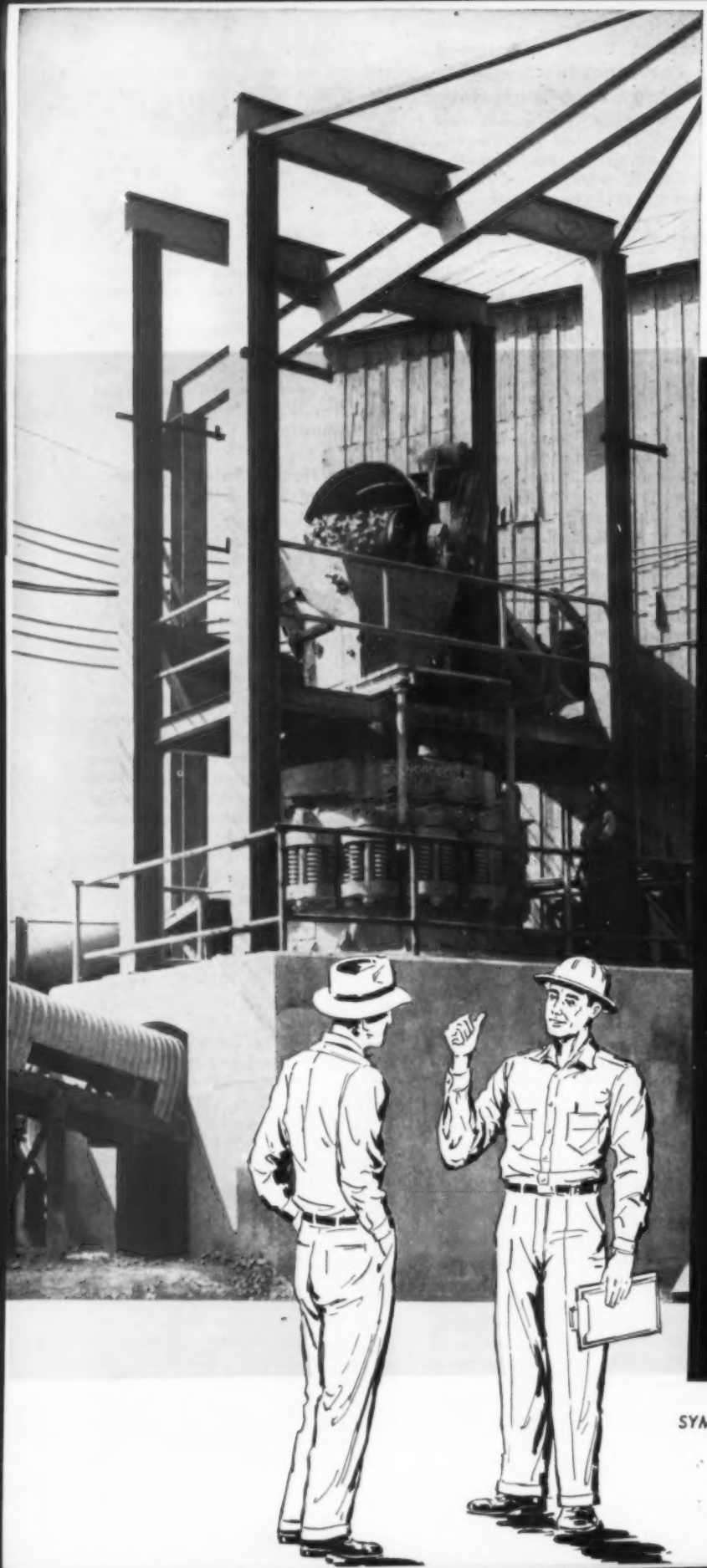
Ralph A. Netzer has been appointed sales manager for Kaiser Sand & Gravel, a division of the Henry J. Kaiser Company, Oakland, Calif. Mr. Netzer replaces C. H. Carson, now a special assistant to the general manager supervising coordination between order and plant production departments.

Mr. Netzer has been with Kaiser Sand & Gravel for 11 years, and has been associated with all phases of the company's operations. He began in accounting, moved to the quality control laboratory, and supervised a sand and gravel plant before joining the sales department.

Olympic Portland Cement Holds Expansion Preview

Approximately 250 invited guests recently had an opportunity to inspect a $2,000,000 improvement project at the Bellingham, Wash., plant of Olympic Portland Cement Company, Ltd., which is nearing completion. The occasion was an open house sponsored by the management of Olympic. Guests were served a luncheon and then conducted through the new facilities by H. M. Krabbe, plant manager.

According to the latter, when the new installations are completed (before January 1, 1958), there will be sufficient additional capacity to permit Olympic to double its production—from 1,000,000 to 2,000,000 bbl. annually. Improved facilities now being installed include limestone-crushing equipment, quarry machinery for drilling and blasting, and a new 410-ft. rotary kiln. The big kiln will be the second of this size to be placed in operation at the Bellingham plant.



You Get Increased Productivity at Lower Ton-Hour Crushing Cost by using SYMONS® CRUSHERS all the way

SYMONS . . . a registered Nordberg trademark known throughout the world.

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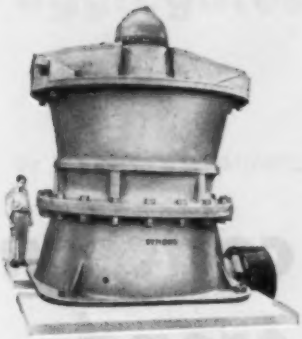
• Symons Crushers are designed and built to produce big tonnages of specification aggregate, bituminous mixes, sand and cement. Higher productivity at the lowest ton-hour cost are two of the sound operating advantages of Nordberg built crushers . . . from the Gyradisc® on up through Symons® Cones and Primary Gyratories.

Every one of these crushers is soundly engineered and ruggedly built to provide today's required performance. Good reason why they are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Crushers for both stationary and/or portable service.

Write for descriptive literature.



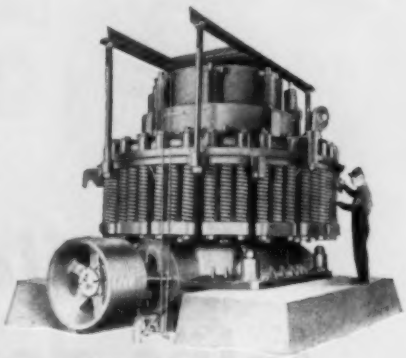
SYMONS 42" GYRATORY CRUSHER

SYMONS PRIMARY GYRATORY CRUSHERS

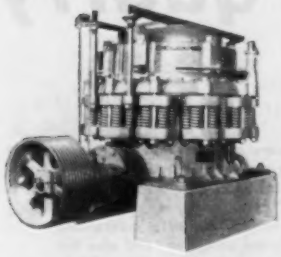
(Left): These gyratory crushers are built for big tonnage, heavy duty primary breaking in 30", 42", 48", 54", 60" and 72" feed opening sizes, for capacities up to 3500 or more tons per hour.

SYMONS STANDARD CONE CRUSHERS

(Right): Standard Type Symons Cone Crushers are built for primary and secondary service in 6 sizes with crushing heads from 2' to 7' in diameter. Capacities in open circuit range from 15 to over 900 net tons per hour.



SYMONS 7'
EXTRA HEAVY DUTY CONE CRUSHER



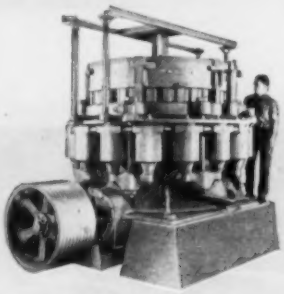
SYMONS 4' SHORT HEAD CONE CRUSHER

SYMONS SHORT HEAD CONE CRUSHERS

(Left): Short Head Type Symons Crushers are built for fine reduction. Offered in 5 sizes with crushing heads from 2' to 7' in diameter. Capacities up to 420 net tph in closed circuit operation, with greatly increased capacities in open circuit crushing.

GYRADISC® CRUSHERS

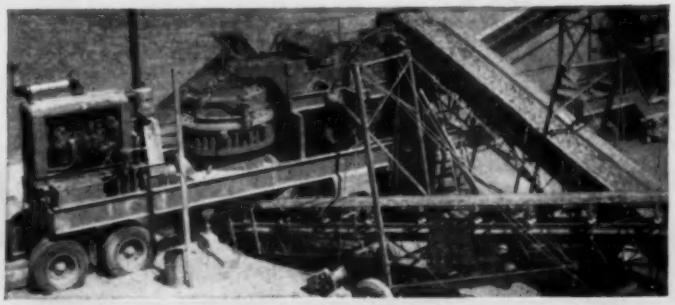
(Right): Built to supplement the Symons Cone Crusher, the 54" Gyradisc Crusher is providing volume production of still finer specification material, such as ag-lime, limestone chips, sand, rock dust, crushed stone for asphalt mix, and the fine reduction of asbestos and talc.



54" GYRADISC CRUSHER

FOR PORTABLE SERVICE

Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids Model 4-ICS portable intermediate crushing plant utilizing a 4' Symons Cone Crusher, shown at the right.



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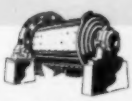
Q457

SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS



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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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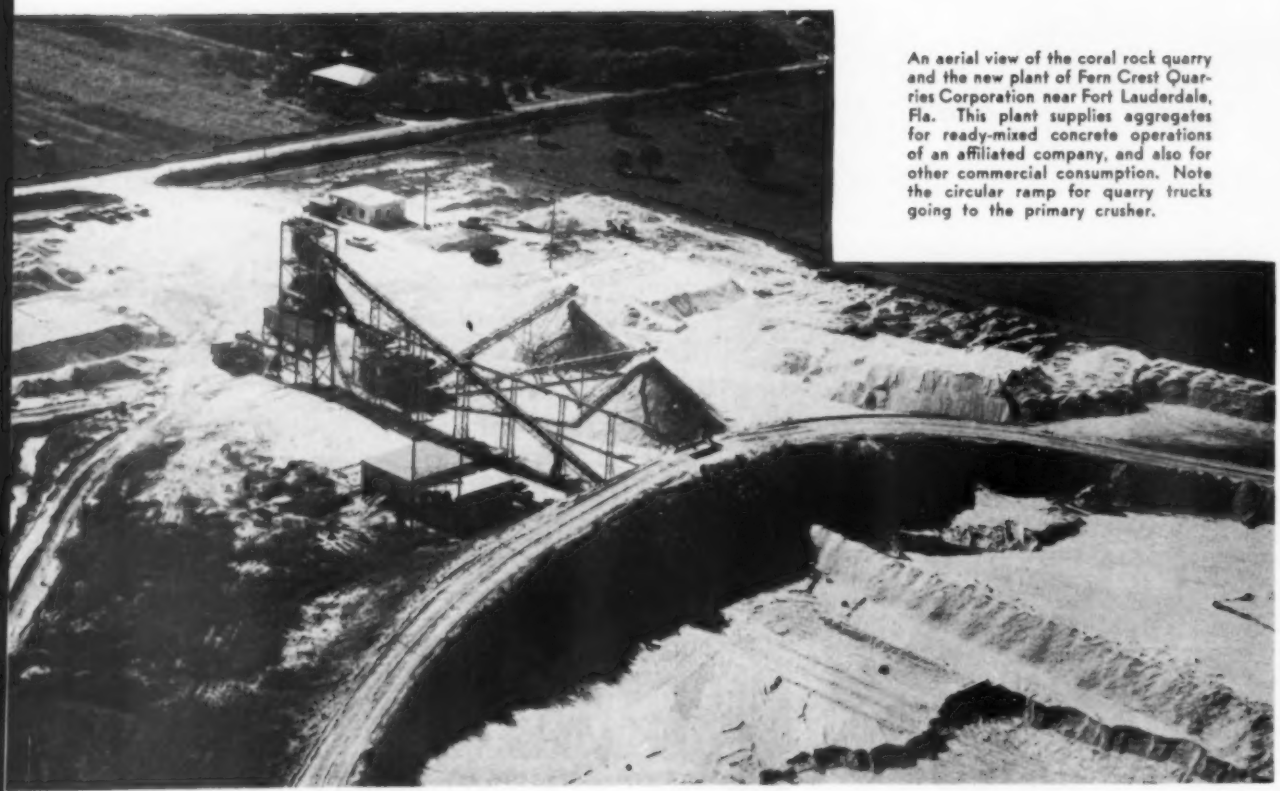
Rock dumped by pit trucks into the truck ramp hopper is separated through 2-in. openings of a feeder-classifier; oversize is fed to the primary crusher seen here.

florida r.m.c. concern joins do it yourself trend— opens own quarry



An aerial view of the coral rock quarry and the new plant of Fern Crest Quarries Corporation near Fort Lauderdale, Fla. This plant supplies aggregates for ready-mixed concrete operations of an affiliated company, and also for other commercial consumption. Note the circular ramp for quarry trucks going to the primary crusher.

Ready Mix Concrete of Ft. Lauderdale operates quarry to supply needed aggregates

By WALTER E. TRAUFFER

A closeup of the screening tower and sand classifying equipment. The horizontal conveyor, left center, carries material retained on the top deck of the upper screen back to the primary crusher.

ANOTHER ON THE SPOT REPORT

MORE and more manufacturers of ready-mixed concrete, concrete products, etc., are finding it advantageous to produce their own aggregates, thus getting better control of quality and supply. One of the latest to do this was the Ready Mix Concrete Company, Inc., of Fort Lauderdale, Fla., which operates three ready-mix plants in and near that city. In order to do this, the Fern Crest Quarries Corporation was formed to operate a quarry at 3300 S. W. 47th Ave., in Fern Crest Village. This is a suburb southwest of the city which has been separately incorporated for industrial purposes only. The plant was designed for a capacity of up to 200 t.p.h., which can be doubled by adding a second pair of screens.

Considerable core drilling was done before this deposit was located and proved. The rock is the coral rock common to this area; it is hard and abrasive, meeting all specifications for concrete aggregates, etc. The deposit is 36 to 38 ft. in depth and has an average of 2 ft. of soil overburden, which is removed by scrapers and draglines.

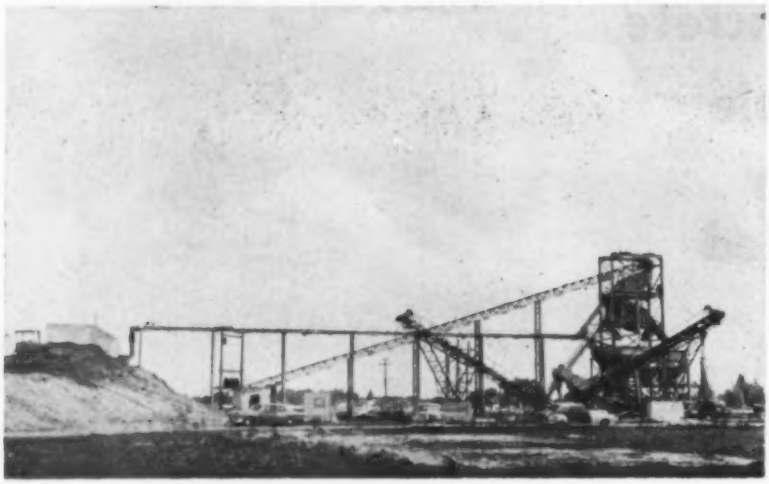
The drilling, blasting and loading of the rock has been contracted locally. The water table is only a few feet below the surface of the deposit, and rock is removed to a depth of 30 ft. Drilling is done with a Schramm rotary drill, and the dynamite is loaded through a tube. Excavating of the shot rock is done with a 2½-cu. yd. Northwest dragline. This unit is supplemented by an 820 Lorain dragline with a 75-ft. boom, which is also used for stripping.

The draglines discharge the rock in long stockpiles so that the material can dry. After about 30 days this material is loaded by a 2½-cu. yd. Lorain shovel into 20-cu. yd. Euclid trucks. The trucks haul for a distance of 200 to 300 ft. to the plant. There the material is discharged from an earthen ramp into a 25-cu. yd. hopper, and thence onto a 48-in. by 14-ft. Universal Engineering Wobbler feeder with 2½-in. openings. The oversize goes to the No. 3645 Universal double-roll Impactmaster primary crusher, which is served by an overhead electric crane. The minus ¾-in. product of the crusher and the minus 2½-in. feeder-grizzly throughs are carried on a 36-in. by 20-ft. feeder belt to the 30-in. by 172-ft. main belt conveyor.

At the top of the screening tower this conveyor discharges the material on a 4- by 14-ft. Simplicity 3-deck screen which has ⅞-, ⅜-, and ⅛-in. openings and is equipped with washing sprays on the two top decks. All oversize (⅞- to 2½-in.) is carried back to the crusher on a 24-in. by 142-ft. horizontal belt conveyor. The ⅜- to ⅞-in. material off the second deck goes to one of the three 25-cu. yd. steel plant bins as ¾-in. rock.

The ⅛- to ⅜-in. material over the bottom deck of this screen goes to a second 4- by 14-ft. Simplicity 3-deck screen. This unit has 5/16-, ¼-, and ⅛-in. openings and is also equipped with washing sprays. The material off the top deck (5/16- to ⅜-in.) goes to a bin, and that over the second deck (¼- to 5/16-in.), known as "rice rock," goes to the other of the three bins.

The minus ⅛-in. sand and water



An overall view of the plant site, showing the truck ramp, left, the screen tower, right, and between those points the inclined feed belt and horizontal return belt for oversize rock.

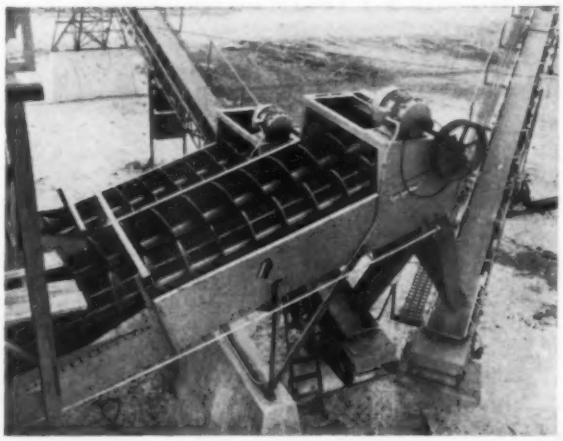
through the bottom decks of both screens is flumed to an Eagle Iron Works 7-unit scalping tank. The coarse sand settled out by this tank goes to the first of two Eagle 36-in. by 24-ft. twin-screw sand washers, along with the ⅛- to ¼-in. material off the bottom deck of the last screen. The product is concrete sand, which goes to one of two 24-in. by 100-ft. stockpiling belt conveyors.

The medium-sized product of the scalping tank goes to the second identical screw washer, along with the overflow from the first screw. The product of this washer, mason's sand, goes to the second identical stockpiling conveyor. Both conveyors discharge from a height of 30 ft., giving a storage capacity of 500 tons in each pile. The sludge from both washers, containing about 10 percent solids, is flumed to a sump from which it is pumped to a waste pond. The Allis-Chalmers 25-hp. centrifugal pump handles about 1,500 g.p.m. This material will be reclaimed from time to time and sold for fill. Wash water for the plant is supplied from a 12-in. dia., 140-ft. deep well at 1,800 g.p.m. by a 125-hp. Worthington pump.

Delivery of the products to the company's ready-mix plants and to customers is by contract trucks. These are loaded with coarse aggregates under the bins, and a 24-in. by 30-ft. blending belt can supply any desired combination. A Michigan Loader is used for loading sand from the ground stockpiles.

J. W. Birdwell is president of Fern Crest Quarries Corp., as well as of Ready Mix Concrete. The late Roy B. Dean was plant superintendent, in charge of the plant construction. The plant was designed by E. Lee Heidenreich Jr., consulting engineer, Newburgh, N. Y.

This plant is of all-steel and concrete construction. All equipment is pushbutton-controlled from the crusher operator's platform. Only four men, in addition to the superintendent, are required to operate the plant, exclusive of quarrying and loading. The primary crusher is V-belt driven by 100- and 25-hp. motors through V-belts. The feeder is driven by a 15-hp. motor. Belt conveyors are driven by 25-, 5-, and 3-hp. motors, respectively, through V-belts and speed reducers, and the stacker conveyors are similarly driven by 7½-hp. motors. The screens are V-belt driven by 15-hp. motors through V-belts, and the screws by 25-hp. motor-reducers and V-belts. The conveyor idlers have sealed roller bearings.



This view of the two screw classifiers, taken prior to initial operation, shows also the two identical conveyors on which sand products are transferred to stockpiles.

U. S. Cement Facility Sought By Ghana Industrialist

Dr. Nii Akrampahene Vanderpuije, president of Prima Ghana Industries, Inc., one of the new industrial ventures of the recently formed African nation of Ghana, has been inspecting various cement plants in the United States.

Dr. Vanderpuije stated that his firm will buy a suitable plant in this country or build one here; or it will purchase equipment and ship it to Ghana, to be installed there. If the Ghana concern decides to build and operate a plant in the United States, the management will bring in African workers and train them here. If a plant is erected in Ghana, it will be operated with imported raw materials.

The Ghana industrialist, a graduate of the University of Pennsylvania, hopes to find a plant which will turn out from 100,000 to 150,000 bbl. of cement annually.

E. Guy Sutton Dies at 81— Pioneer in Association Work

E. Guy Sutton, who was one of the founders of the National Sand and Gravel Producers Association, and its first secretary, died recently of a heart ailment in Mattoon, Ill. He was 81 years old.

He was employed by the Carmichael Gravel Company, Williamsport, Ind., 1906. In 1917 he was named secretary of the Indiana Sand and Gravel Association, which he served while also discharging the duties of volunteer secretary of the National Sand and Gravel Producers Association. The following year he went to Washington, D. C., to become secretary of the War Service Committee on Mineral Aggregates.

In 1922 he accepted the post of vice-president of the Carmichael Gravel Company; and when that firm was sold to the Neal Gravel Company of Mattoon, in 1924, he became affiliated with the latter.

For more profitable aggregate production

HERE'S WHY YOU SHOULD BUY CEDARAPIDS

YOU GET GREATER TONNAGES — Each Cedarapids component is designed for big capacity that can't be matched by any comparable unit. Combine these big-output components in your Cedarapids engineered stationary plant and watch your tonnage figures soar to more profitable heights!

MAINTENANCE IS LOWER — Every Cedarapids component is *quality-built*, with many parts heat treated and stress relieved to give long years of productive service. The money you save on fewer repairs and minimum down time is pure profit!

HANDLE ANY AGGREGATE PRODUCING JOB —With specifications increasingly strict, the producer whose plant is *engineered to his specific job* will profit most. In the complete Cedarapids line, there's a size and type of component to meet your specifications in any volume desired.

PLANTS ARE "TAILORED" TO THE JOB — Field-experienced Cedarapids engineers help you select the components most effective for your particular job conditions, and combine them to give you *extra* capacities of specification products.

CEDARAPIDS PRIMARY CRUSHERS

Big 4248 Cedarapids Jaw Crusher with Vibrating Grizzly

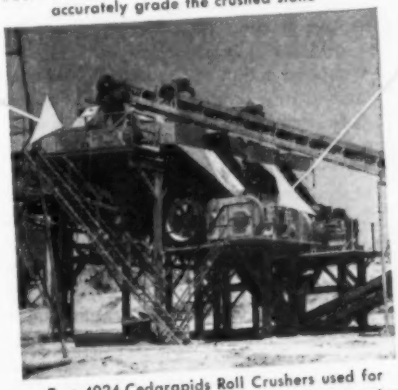
To meet primary crushing needs, Cedarapids offers Single Jaw or Twin Jaw Crushers and Double Impeller Impact Breakers in a complete range of sizes. Used as large separate units, or in portable plants, all Cedarapids crushers are engineered for the highest capacity and long, trouble-free life. The addition of vibrating grizzlies or scalping screens greatly increases production for more profitable operation.

Two 3042 Double Impeller Impact Breakers used for primary reduction

Four 48" x 12' Cedarapids double deck Screens accurately grade the crushed stone

CEDARAPIDS HORIZONTAL VIBRATING SCREENS

Horizontal Vibrating Screens give 12% more effective screening area than inclined screens of the same length, plus 20% to 30% more effective gradation. With the horizontal position of the screen and almost vertical fall of material, the full area of each screen cloth opening is available for material to pass through.



Two 4024 Cedarapids Roll Crushers used for secondary crushing in this efficient stationary set-up

CEDARAPIDS SECONDARY CRUSHERS

Six sizes of Cedarapids Roll Crushers meet your requirements for big volume production of smaller sized aggregates at low cost. For secondary crushing of limestone, Cedarapids Hammermills produce a much finer quality of products, and size for size, turn out more tons per hour than other similar types of equipment on the market.

Cedarapids — Built by IOWA

● With the increasing demands for specification aggregate to meet the needs of the roadbuilding program, it will pay you to take advantage of Cedarapids quality-built equipment and engineering service. See your Cedarapids dealer today, or write for full information.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Importance of Nonmetals Told At Mining Congress Meeting

By HARRY F. UTLEY

ALTHOUGH billed as the 1957 metal-mining and industrial-minerals convention of the American Mining Congress, only one of 21 sessions was devoted entirely to the nonmetallic minerals industries. The annual gathering attracted nearly 3,000 members of the mining fraternity during the 4-day meeting, which opened on September 9 at Salt Lake City.

Major Nonmetals While the emphasis was on the mining and beneficiation of the metals, the overshadowing importance of the nonmetallics was brought forcibly to the fore in an introductory address delivered by Richard J. Lund, assistant technical director of Battelle Memorial Institute. Mr. Lund pointed out that the total U. S. output of industrial nonmetallic minerals in 1956, not including fuels, reached a value of about $3,300,000,000, a new record which was some 6 percent higher than the previous record established in 1955.

"I might remind you further," he explained, "that this was just about 50 percent higher than the value of all the *metallic* ores produced, which was only about $2,200,000,000 for 1956! With the exception of a few scattered years, especially during World War II, the annual value of industrial minerals output in the United States has consistently exceeded that of metallic ore production, and usually by rather wide margins."

With a few exceptions, notably fluorspar, the 18 industrial minerals reviewed in Mr. Lund's talk were revealed either to have established new record outputs in 1956, or were not far behind recent record figures. In most instances, output or consumption of these minerals is at this time running about the same as in 1956. Markets now are generally firm and demand during the next 6 months is expected to hold at present levels.

Strength in heavy engineering and nonresidential building pushed the construction industry to new highs in the first half of 1957, in spite of the decline in home building. This latter decline, said Mr. Lund, has taken its toll in curtailed demand for such minerals as gypsum, lime, asbestos, perlite, vermiculite, and clay products. The strike in the cement industry posed a threat but turned out to be relatively short. Even before the strike, however, cement output was running well behind 1956.

Among the bright spots, as revealed by Mr. Lund, were the following facts: Leaders in the gypsum industry, which is operating now at only 80 percent of capacity, are continuing to plan new fabricating plants; the expanded-clay and shale-aggregate industry is growing rapidly, and many brick companies are forming lightweight-aggregate subsidiaries; asbestos output is running at 1956 levels, the outstanding development in this industry being the huge program of Lake Asbestos Company at Black Lake, Quebec. Mr. Lund predicted that the planned output of 100,000 tons of fibers at this new operation, starting in 1958, will boost Canada's production by 10 percent, and world output by 7 percent.

The entry of National Potash Company as a new producer in the Carlsbad, N. M., district early this year will help to swell the capacity to supply increasing domestic and world needs for potash; but the outstanding event in the potash industry in Mr. Lund's opinion is the current development of the Saskatchewan deposits, the richest known reserve in the world; production from deep shaft mines (3,400 ft.) is expected to start next year.

Domestic producers of feldspar continue to face severe competition from ground nepheline syenite imported duty-free from Canada under its tariff classification as "sand"! Despite this fact, Mr. Lund reported, a new $1,000,000 plant at Spruce Pine, N. C., and another costing $3,500,000 near Anacostia Island, will soon augment what is already an over-supply situation in feldspar. The latter plant will use an electrostatic process for beneficiating the material.

Two new brine magnesia plants in Michigan, and two sea-water magnesia plants along the Gulf coast—all under construction or projected—will, in the speaker's opinion, provide ample increases in supplies to meet growing needs for magnesite refractories in the steel and other industries.

Industrial Minerals In the session devoted to industrial minerals, Joseph L. Gillson, chief geologist of E. I. duPont de Nemours & Company, traced the huge growth experience of the nonmetallic minerals industries in the years since World War I.

M. H. Gidel (Anaconda Company, Butte, Mont.) described his company's continuing search for new industrial mineral deposits, principally phosphate rock and sulphur. Charles W. Sweetwood (J. R. Sim-

plot Company, Boise, Idaho) declared that his company first became interested in industrial minerals through its development of the phosphate reserves of Idaho and Montana and he described some of these ventures.

Nearly one-half the earnings of his company are derived from the operations of its chemical divisions, according to O. A. Power, mineral-development manager of Food Machinery & Chemical Corporation, Pocatello, Idaho. These chemical-processing plants require over 2,000,000 tons of mineral raw materials annually, including phosphate rock, dolomite, barite, silica, and a variety of earths such as diatomite.

Drilling and Blasting Symposium Drill-bit manufacturers for the mining and quarrying industries must produce a variety of bit designs because no single type of bit is suitable for every drilling condition, M. W. Hawkesworth told those attending a drilling symposium. Mr. Hawkesworth, general sales manager of the Western Rock Bit Manufacturing Company of Salt Lake City, in discussing the various types of drill bits, said that each has its own peculiar advantage for a specific drilling problem. Floyd R. Anderson, chief metallurgist, Gardner-Denver Company, reported that laboratory tests have increased the rate of new developments in drilling equipment, but that actual progress has been related to mechanical rather than metallurgical research because mechanical refinements have been necessary to utilize the known advances.

The use of ammonium nitrate for blasting results in more work for each dollar spent for explosives, according to Dort Tikker of Monsanto Chemical Company. Speaking at an open-pit mining session of the convention, Mr. Tikker explained a series of experiments conducted by his company to utilize the potential value of ammonium nitrate. Most promising is a mixture of the chemical with fuel oil, which changes the ammonium nitrate from a low- to a high-value explosive at virtually no additional cost.

Preliminary results in the use of ammonium nitrate for blasting purposes at Kennecott Copper's Bingham Pit shows that it provides substantial savings in powder costs, without decreasing the powder factor, according to L. E. Snow, a general foreman at the big pit. Other advantages are a decrease in blasting labor man-hours per hole, fewer man-hours of exposure, easier handling of a less sensitive powder, and a lower loading hazard. Mr. Snow said that the use of ammonium nitrate at the Kennecott pit has been increasing steadily. In the month of July, 1957, more than 50 percent of all powder used was ammonium nitrate.

Belt-Conveyor Transportation Stressing the advances made in belt conveyor transportation, A. Arguendas, Raybestos-Manhattan, Inc., pointed out in a talk at an open-pit mining session that the use of synthetic fibers has resulted in conveyors of unusually high strength which are impact-, fatigue-, and rip-resistant. In his opinion, high-tension belts must be operated at their maximum safe-load limits, and care must constantly be exercised to eliminate overloads, slippage, excessive wear, and damage.

Martin Vander Laan, manager of operations for the engineering division of Hewitt-Robins, Inc., cited the technical and operational advances which are being made in belt conveyors. "To bring this problem into focus, we must visualize the belt conveyor a short decade or two ago," he pointed out. "At that time a 36-in. by 500-ft. conveyor was something unusual, and a 150-hp. drive was the exception, rather than the rule. Today we are considering 60-in. by 12,000-ft. belt to handle 6,000 t.p.h., with a drive consisting of three 900-hp. motors, for a total of 2,700 hp."

As further evidence of the progress being made in the conveyor field, Mr. Vander Laan cited an instance in Mexico, where 45 separate flights have been linked together underground for a distance of 7½ miles. He also said that before the year is ended, passengers with baggage will be transported from the airport building at Dallas to the boarding lanes of the planes on conveyor belts. These "moving sidewalks," he said, will go uphill, downhill, and turn right-angled corners.

A description of a 1,900-ft. rope-suspended belt conveyor used to bring ore to the surface by International Minerals & Chemical Corporation, at its Carlsbad potash mine, was given by E. C. Skinner, manager of the company's potash division.

Installation of the conveyor has made it possible, he said, to reduce the number of mine cars in use by 60 percent; and improved speed and loading efficiency has enabled production per man-hour to increase by 35 percent. In installing the rope-suspended conveyor as opposed to belt conveyors of standard construction, the company achieved great flexibility; and uncrushed ore can now be put on the belt itself. This belt travels at the rate of 350 f.p.m.,

Recreational Feature A highlight of the convention was the open-air barbecue served on the floor of the world's largest open-pit copper mine in nearby Bingham Canyon. More than 50 buses were needed to transport nearly 2,000 persons from downtown hotels to the pit on the evening of September 10. The Kennecott Copper Corp., owners and operators of the big pit, were hosts for the event.

The 1958 convention, plus a huge equipment exhibit, will be held September 22 to 25 in San Francisco. (Shows are held in alternate, even-numbered years.) Sessions will be held in the San Francisco Civic Auditorium, and the show is scheduled for the Plaza Exhibit Hall.

Labor Developments

(*From page* 68)

a struggle in which they, the innocent bystanders, are frequently shot.

The obvious response to such developments would be new legislation. This is already being worked on in many quarters in Washington. But legislation may not be an unmixed blessing to employers. As we have seen, legislation often has some unexpected consequences.

Furthermore, the best prediction is that labor legislation, regardless of which party controls the Congress, is unlikely to be one-sided. Thus, legislation designed to restrict certain union activity or designed to require certain standards of conduct from union officials will probably also contain parallel requirements for employers. This fact has been observed in the proposed legislation following the revelations of corrupt practices in connection with welfare plans. In the last Congress, no such legislation was passed because it was not possible to get agreement either on legislation applying only to plans in which unions participated or to all plans, including those operated exclusively by employers.

Many employers are truly fearful of the effect of inter-union warfare on their own welfare.

Bessemer Limestone and Cement Company recently held an open house and two-hour tour of its new $4,500,000 plant at Bessemer, Pa.

prompt action will determine

the extent of your

1957 Income Tax Savings

By HAROLD J. ASHE

"I can't be bothered about income tax problems," remarked a non-corporate quarry operator. "Every Spring I have an accountant prepare my income tax return. Let *him* worry. That's what he's paid for."

Granted that experienced counsel may best prepare an income tax return, there is one fatal defect in the above conclusion. An accountant is presented with accomplished facts. He cannot change these facts, no matter how substantially an income tax bill might be reduced by changed circumstances. All he can do is to reflect these facts in the income tax return, and to make certain that neither favorable nor unfavorable situations are overlooked.

However, the quarry owner himself, *before the year-end,* may shape many of his actions for an income tax advantage, may exercise certain options still open to him, and may make an intelligent decision as between two alternatives affording different income tax results. Usually he cannot have another person do these things for him; neither, ordinarily, is anyone else likely to call his attention to circumstances affording possibility of reducing his income tax. Only he has a sufficiently intimate knowledge of all aspects of his business, non-business income activities, and personal and family situations to make intelligent decisions calculated to reduce his income tax.

If a taxpayer does take time to do so, he may have a substantial income tax saving to show for his efforts, perhaps far more than he can earn hour for hour in any other business activity during the year. Moreover, he can space this study of his income tax situation over a period of weeks, during slack periods, week-ends or evening hours, so that his other business affairs are not neglected.

(For purposes of this discussion the article will address itself to the non-corporate quarry owner, dealing with his *total* income tax problems and not those of his business alone. This will simplify, rather than complicate, the discussion. However, at appropriate points, there may be the same applicaton to corporate quarry ventures; other points of non-business reference will apply to corporation officers in respect to their individual income tax returns.)

It is not necessary that a quarry owner know all of the fine points of the Internal Revenue Code. Properly, this is the responsibility of his accountant. He should concern himself before the year-end with two primary considerations: (1) how and where income tax savings, if any, may be made in his 1957 income tax return; and (2) timing, as between taking a tax saving in 1957 or rejecting it then in favor of carrying it over until 1958, if there is a choice in years.

Earnings and Prospects In respect to possibilities of reducing business earnings, a quarry owner may be obliged to make some hard decisions. If, as later discussed, it is possible to reduce 1957 net earnings, this may be wise. However, if 1958 earnings are likely to be substantially higher (by at least one or two tax brackets), it may be better not to try to reduce 1957 net earnings. A greater tax saving may be effected in 1958, if optional tax reducing opportunities are deferred until that year. Except for this important qualification, the sooner a tax saving is taken, the better. The taxpayer gets an immediate benefit instead of one postponed 12 months. This means that he has the use of funds so saved a year sooner, which is no small consideration in itself.

Second, what 1958 holds for a taxpayer is highly speculative at best. Finally, there is now at least some prospect that there may be an adjustment downward of individual income tax rates in 1958. If so, a deferred tax saving may be worth considerably less than in 1957, in addition to a wait.

(Smaller corporations whose earnings see-saw back and forth year after year around the $25,000 level —and sometimes somewhat above that figure—should be particularly alert to the tax rate that takes effect above $25,000. If earnings stand at $25,000 or less, a tax reducing action pays off at the 30 percent rate. If deferred until a year in which earnings break through the $25,000 level, a tax saving is at the 52 percent rate.)

Business Expenses A quarry owner should look around his business, analyze his needs, see which additional expenses may as well be incurred in 1957 as in 1958. These, be it understood, are *necessary* outlays, perhaps long overdue. Only the matter of timing is in question.

There are numerous items of expense which, if incurred before the

year-end, will reduce the net earnings of a business; or, if not incurred, they will increase net earnings. The net earnings will be decreased or increased by the exact cost of the expense items, incurred or not incurred.

A good rule to observe, other things being equal, is to *incur such expenses in the year the need appears.* Then during the next year other needed expenditures can be made, leveling each year's income. Too often, certain expenditures are excessive in one year, because needs have been allowed to accumulate for several years, and are then taken care of in one year. This sharply reduces net earnings for that year, it is true, but some of the tax benefit is often reflected at lower bracket tax rates than otherwise. If such expenditures are more evenly applied each year as needed, all of the tax benefit is available at each year's highest bracket income subject to income tax. This may represent a substantial additional income tax saving over a period of years. But note the exception to the foregoing: "bunching" such expenses may be profitable if net earnings fluctuate sharply from year to year, incurring heavier expenses in years of higher net earnings when the tax effect will be more favorable. (See earlier reference to smaller corporations.)

Expense items which should be considered before the year-end include fleet repairs and overhauls, equipment and machinery repairs, office equipment repairs, buildings maintenance, possibly office interior repainting.

New Equipment Acquisition of capital items at the year-end will have no effect on the 1957 income tax. However, if such assets are acquired at the end of the year, this will assure a full year's depreciation, starting with the 1958 income tax return. If a quarry owner's equipment and machinery is becoming obsolete and he is losing the competitive race, with production costs mounting because of obsolescence, the chances are that depreciation charges as a cost of doing business are also declining. This carries a heavy income tax penalty and it should be remedied, both to gain a more favorable competitive position and also to finance in part new machinery and equipment out of income tax savings.

At this point, serious attention should be given to electing a stepped-up method for depreciating new equipment. One of the reasons Congress gave for permitting accelerated depreciation was to encourage plant modernization, and to make the outlays *initially* less burdensome.

Year-End Bonuses With a close estimate of business earnings before the year-end, a quarry owner may consider for the first time the wisdom of distributing some profits among his employees. This may take the form of a moderate Christmas present for each employee or a substantial bonus check, perhaps based on senority and other factors. If this is already a practice, a quarry owner's earnings may warrant sweetening the bonus. He may pick up the tab for a Christmas party, a gesture which would promote better employer-employee relations and bring employees' families closer to the business.

As a business expense, such bonuses, cash presents, or those "in kind" will reduce the income tax bill at the rate in which the highest level of a taxpayer's adjusted gross income is subject to tax. If he is in the 38 percent tax bracket, $500 in bonuses will reduce by $500 income subject to the 38 percent rate. Result: Net cost, after tax, $310.

Bad Debts A common failing, particularly in smaller concerns, is the practice of carrying aging accounts receivable almost indefinitely, instead of taking them as a bad debt deduction as soon as this is available. This practice is dangerous on two counts: (1) it inflates net worth with worthless accounts receivable, causing a quarry owner to feel better off than the facts warrant; (2) an income tax deduction may be lost because such bad debts are deducted too late. A bad debt deduction *must* be taken only in the year its worthlessness is established. Separating worthless accounts from collectible accounts, establishing the facts of worthlessness before the year-end should be a "must". Note: If a bad debt is taken as a deduction, this does not foreclose later collection if the debt again becomes collectible.

Casualty Losses Casualty losses in excess of insurance recovery, if any, should be reduced to paper before the year-end. In fact, this should have been done immediately after the losses occurred. Memoranda should be preserved, to become a part of accounting records used in later preparation of the income tax return. A quarry owner may sustain either business or non-business losses, or both, not overlooking unreimbursed theft or robbery losses, storm damage to his home or business, and car accidents. Waiting until tax filing deadline to reconstruct casualty losses may result in their oversight due to a failing memory.

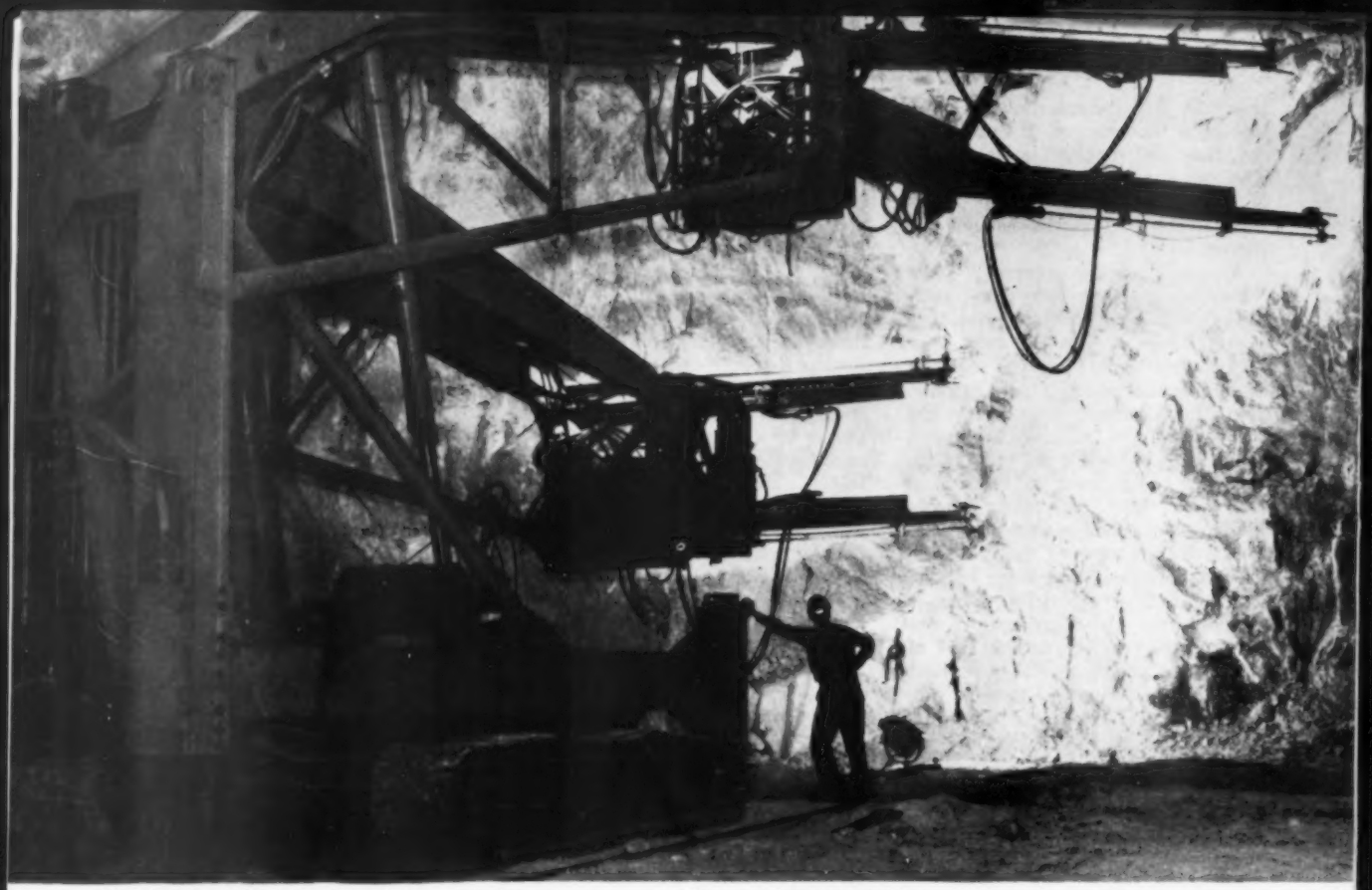
Depreciation If a quarry owner has acquired *new* depreciable assets during the year, and these have a normal useful life of three years or more, he may use a stepped-up depreciation method (double-declining balance or sum-of-the-years digits methods). If he uses an accelerated method instead of straight-line depreciation, heavier depreciation charges for the year may have a bearing on other decisions he may make; so he should at least consider before the year-end which method will be used.

A younger, smaller quarry owner whose net earnings are moderate, and who is in a lower tax bracket, may elect the straight-line method for an overall tax saving. This may be wise because earnings in later years, in higher tax brackets, may be more favorably affected by larger depreciation charges then instead of now. The trouble is that he may be cramped for funds because he is not established, and he may welcome any tax savings now at the expense of later years. This is a tough problem which he must work out.

Equipment, machinery, and other depreciable assets acquired in used condition cannot be depreciated by a stepped-up method.

In the case of smaller quarry owners, particularly if their records are inadequate, there is a good likelihood some depreciation charges are not being taken. That is, some assets may never have shown up on depreciation schedules in income tax returns. It may be argued, "That can't happen!" The fact is that it has happened. If a quarry owner suspects this to be the case, it may pay him to make a physical inventory, checking his records. If he uncovers such assets. it is permissible for him for the first time, to take depreciation on these items, provided that at the beginning of 1957 they are not as old as or older than the normal useful life, which must be used in determining the annual rate of depreciation.

However, note carefully, only the *remaining useful life* may be taken, calculated on the basis of normal useful life from the date of acquisition. That is, if the normal useful life is 10 years, with 5 years remaining, each year for 5 years one-tenth



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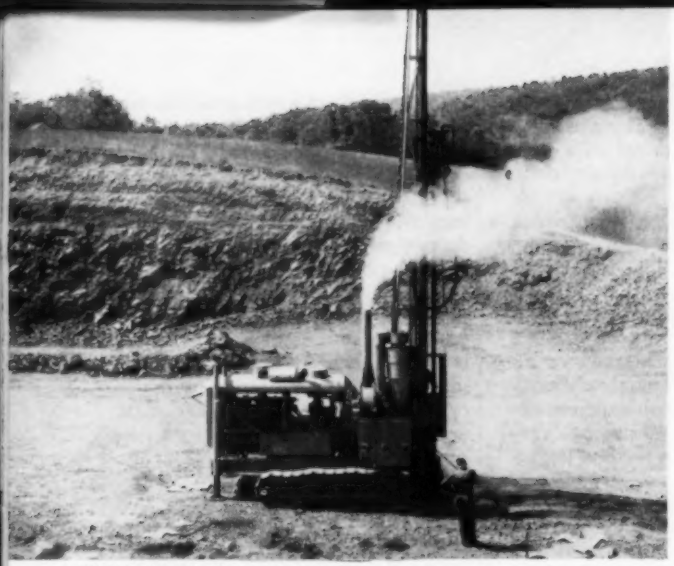

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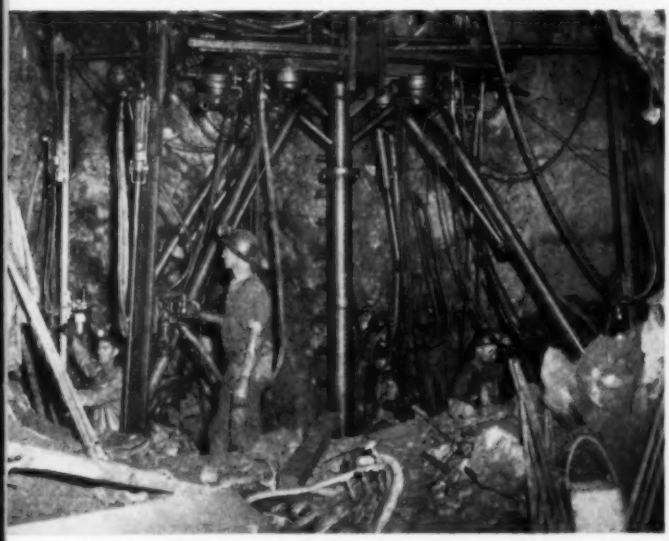

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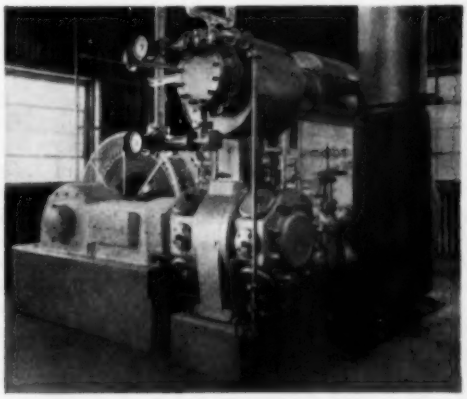

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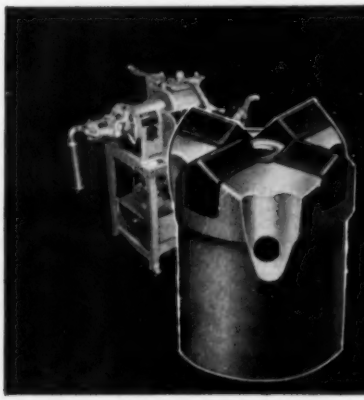

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of the cost may be taken, hence the column heading in the depreciation schedule "Depreciation allowed (or *allowable*) in prior years." Cost, at date of acquisition, must be used as the basis, not the present estimated (probably inflated) value.

Capital Gains and Losses A taxpayer who has taken a capital gain during 1957 may be justified in examining other holdings, to consider whether an offsetting loss should be established before the year-end.

Income Properties If a quarry owner has income properties, these should be scrutinized for possible income tax savings. There is a noticeable tendency for rental property owners arbitrarily to make each rental property stand by itself, showing a favorable net return, regardless of income tax penalties which may stem from such a policy. This practice is sometimes referred to as "good business." However, this may be a doubtful management virtue if its carried to its logical conclusion, particularly if repairs, painting, and other maintenance needs are being neglected and long overdue. Often these needs are not taken care of on the plea that gross rental income does not warrant outlays, or that such expenditures would sharply reduce net earnings or even, on occasion, show a loss for one year. This practice overlooks two important considerations.

The first is that lack of adequate maintenance and repairs may result in permanent damage to the property and a decline in value, speeding up obsolescence. Losses so sustained may far exceed the cost of the necessary outlays "saved." This is sometimes difficult for a property owner to understand, even a quarry owner who keeps his *plant* in top condition for sound business reasons. Often the decline in *real* value is obscured from view because in nominal dollars, thanks to inflation, value seems constant.

Second, property expenses should be related to the property owner's *total income from all sources*, not just isolated property. Added rental property expenses not only reduce net income from rentals, but such expenses reduce by a like amount the adjusted gross income. This additional expense is reflected in an income tax reduction at the tax rate to which the highest bracket of income is subject.

Here is another fact worth considering. Making necessary repairs and maintaining a property as needed may result in a sale at a more favorable price, even as an income tax deduction is acquired at a high tax bracket rate for repair costs. If a gain results, the gain is subject to low long-term tax rates, provided that the property was held for more than six months.

Divisible Expenses Frequently plant owners have expenses which are partly business or income-producing, and partly personal. To the extent that such expenses are business or income-producing, they should be reflected in income tax returns.

A typical example of such an expense is that of maintaining a car used both for personal reasons and for business. Business use does not include going to and from the place of business. This use is for personal convenience, just as an employee so using his car cannot deduct its expenses. However, if the car is used to make business trips, call on customers, attend business association conventions, this is business usage. A division of total expenses must be made on the basis of the facts surrounding each individual case, whether business use is 10, 25, or 50 percent of total use.

All car expenses should be totaled and then be apportioned on the determination of the percentage of business use. Such personal use expenses as are permissible personal deductions should be taken, if standard deduction is not elected. Depreciation should not be overlooked in that proportion chargeable to business use. Personal depreciation of the car is not allowable.

Personal Deductions Personal deductions already paid before the year-end should be itemized, and should be compared with the standard deduction available on estimated adjusted gross income (10 percent of adjusted gross income up to the maximum of $1,000). If itemized deductions are close to or already exceed the standard deduction, a quarry owner should investigate the possibilities of acquiring additional deductions before January 1, 1958. This should be done on the basis that such outlays are necessary and would be made after the year-end in any event. This is known as "bunching" deductions in one of two successive years; often the standard deduction is used the next year, with an overall tax saving for the two years.

Here is a warning! In calculating deductable medical expenses, a taxpayer should remember that *the first 3 percent of adjusted gross income paid for such expenses must be excluded; only such amounts spent above this figure are deductible.* In short, if a taxpayer's family isn't very sick or sick very often, he can't deduct the expenses. On the other hand, he *can't deduct some medical expenses.* There is a ceiling of $2,500 per exemption, maximum $5,000 for single taxpayers with two or *more* exemptions; married persons, filing separate return with two or *more* exemptions, $5,000 maximum; married couples, filing a joint return claiming four or *more* exemptions, $10,000. In no case can a medical deduction of more than $10,000 be allowed. Age and blind exemptions don't count in calculating exemptions against a medical expense ceiling!

Exemptions One exemption or more may be exposed to disallowance if a quarry owner fails to correct glaring defects before the year-end. This loss can come about through failure to observe carefully the rules governing exemptions. "Guesstimating" generally is not good enough; it may result in exemption losses.

The more-than-one-half test in respect to support of dependents is an arbitrary one. A difference of as little as one dollar in support contributed to a dependent may result in the loss of an exemption worth at least $120 in tax reduction. The *facts,* not the taxpayer's intentions, are determining. Such facts include (1) careful figuring of the dependent's total support, including his own funds, if any, applied to that support; and (2) the amount of support contributed by the taxpayer, and whether this contribution meets the more-than-one-half test.

A quarry owner should carefully figure the total support of each dependent separately before the year-end, together with the amount of his own contribution to support. Because of differing circumstances, what may constitute more-than-one-half support for one dependent may not be true of another. Circumstances surrounding the dependent may rule him out as a dependent. A few dollars more support contributed before the year-end by a taxpayer may salvage an exemption otherwise lost.

Note the following examples.

1. Son A, age 19, is employed, earning and contributing to his support $1,200 a year. His father contributes more than $1,500 to his support. *He is not an exemption* because his earnings exceed the less

than $600 ceiling for children age 19 or over not attending school.

Son B, age 20, is employed part-time, and earns and contributes to his support $1,000 a year. He is attending a school of business administration. The parent contributes $1,200 to his support. *He is an exemption* because of school attendance. He may earn $600 or more while doing so, and the parent contributes more than one-half of his support.

Daughter C, age 17, is employed part-time, and earns and contributes to her support $700 a year. The father contributes $1,200. *She is an exemption* because she is under 19, and the parent contributes more than one-half of her support.

2. A quarry owner and two brothers largely support an aging parent. The parent's contribution to his support is $575; each of three sons contribute $500. Any one of the sons is entitled, by agreement with others, to the parent as an exemption. The more-than-one-half rule is jointly met, and any one of the sons contributes, as required for an exemption, more than 10 percent of the support.

3. A quarry owner's wife is progressively losing her sight. She fails to have an examination of her eyesight until around income tax filing deadline. Although, probably, by the year-end her partial blindness had advanced to the stage at which, by legal definition, she might claim a blind exemption, the exemption is lost. The determining date for an examination to establish a claim for exemption for partial blindness is December 31, 1957.

How well a quarry owner fares in April, 1958, with his income tax return will be determined in large measure by how diligent he was in searching out tax savings before the end of 1957. This can be a most rewarding do-it-yourself project.

Australia Aids New Zealand In Building Cement Plants

Two cement plants have been built in New Zealand: one for Waitomo Cement Ltd., at Te Kuiti, and the other for Southland Cement Ltd., at Orawia.

Both plants were designed by Gippsland Industries Ltd., Victoria, Australia, and modeled after the company's own plant, incorporating the modern vertical kiln method of producing cement. The erection and installation was supervised by Gippsland personnel with the co-operation of Fletcher Holdings, one of New Zealand's largest builders.

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Washington News

(*From p.* 12)

of the problem will probably overshadow the more academic, economic aspect. For this very reason, an attempt by the last Congress to investigate economic policy did not get very far.

Among the most modest of the proposals which are likely to be considered is that made by Senator Prescott Bush of Connecticut, who has proposed legislation which would make the maintenance of a stable price level a major goal of U. S. economic policy. He would accomplish this by including in the Employment Act, additional language which would give price stability approximately the same importance as full employment. This is not a new idea. It was considered when the Employment Act was first debated by Congress, shortly after the end of World War II. At that time, it was specifically rejected.

As may be seen from the above discussion, inclusion of this additional goal might actually give the act two objectives, which could not be accomplished at the same time or by the same policies. This might result in making the Employment Act a complete dead letter.

If, in fact, it is not possible to get both full employment and a stable price level, it becomes the job of each Administration to decide how much its policies should serve each of these objectives. This means extreme flexibility. Such a course is probably best, because policies which may be perfectly appropriate under a particular set of domestic and foreign economic conditions could be entirely inappropriate under somewhat different conditions.

This is the position of many in Washington who have not yet chosen sides. Regrettably, such a sound middle-of-the-road, position rarely prevails in the highly charged atmosphere of political Washington. Rather than this moderate approach, which would permit small changes in policy in either direction as required, it is predicted that there will be a wide swing of policy which would go all out for anti-inflationary measures, restricting business growth, and that this will be followed by all-out measures to stimulate business growth, which, in turn, are likely to be followed by another swing in the opposite direction.

Such instability in policy may be another price which must be paid for the continuous operation of a capitalist economy. It is probably no greater than Professor Slichter's creeping inflation. It is just paid by different people.

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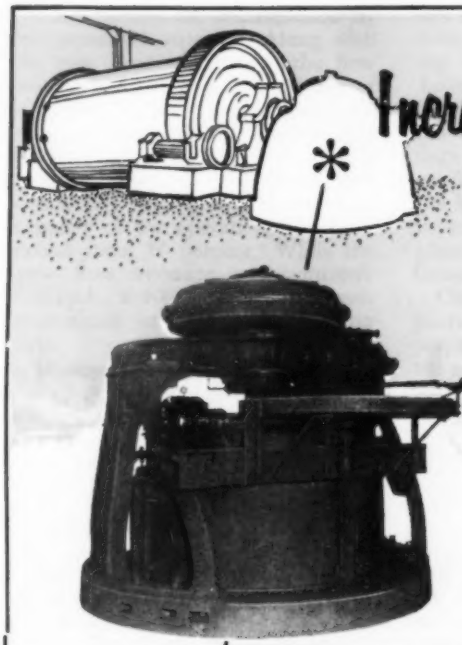
Aglite Corp. to Build Plant For Minneapolis Concern

Sayre and Fisher Company of Sayreville, N. J., has announced that its wholly-owned subsidiary, Aglite Corporation of America, has contracted to construct a lightweight concrete aggregate plant for North Central Light-Weight Aggregate, Inc., Minneapolis, Minn.

The plant will be similar to the one recently completed by Sayre and Fisher at Sayreville and will produce 750 cu. yd. of aggregate a day.

Aglite, owner of 10 percent of the outstanding common of North Central, has a 15-year franchise and service agreement with the Minneapolis company.

R. A. TRIPPEER, president of Euclid-Memphis Sales, Inc., and TOM O'RYAN, president of the Tom O'Ryan Advertising Company, have been elected to the board of directors of the Mississippi Valley Portland Cement Company, Jackson, Miss.



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new haulage system an efficient factor in pit expansion of

Chicago Gravel Company

BY BUREN C. HEROD

AFTER a half-century of sand and gravel pit operations in an part of its property near Elgin, Ill., the Chicago Gravel Company, Chicago, was faced about 18 months ago with a problem concerning the transportation of pit-run material from the remaining virgin area to the existing washing and screening plant.

Sand and gravel had already been removed from approximately 640 acres of the property during that period and brought to the plant on a track haulage system. However, the older diggings and the plant are separated from the northern tract where the company wished to start a new pit by the mainline of the Milwaukee Railroad, which traverses the property from east to west.

Distance was not a primary factor in the problem since the new area, with a raw material reserve for about 20 years of operating, is not as large as the area of the old pit to the south. The chief obstacle involved the crossing of the railroad's tracks with the pit-to-plant haulage tracks if the latter system were to be continued.

It became evident that crossing precautions and attendant restrictions would complicate and disrupt a consistent flow of material to the plant by rail. The decision was made, therefore, to install a track system from the new pit to a transfer hopper on the north side of the mainline, and transport the material from that point to the plant on a belt conveyor system.

Due to the plant's proximity to a large metropolitan area, as well as the routes of a number of expressways that are either in the planning stage or under construction, it was a natural corollary that the opening and installation of a new pit and

This hopper and dump control house is the transfer point between the rail and belt conveyor sections of the pit-to-plant haulage system.

The first section of the new conveyor system passes below the commercial carrier tracks (background), and is 300 ft. long. It transfers at the point in the foreground to a 600-ft. section leading to the scalping station.

haulage system be accompanied by an expanded capacity. Along with the new conveyor system, the flow was revised through the addition of a scalper and primary crushing circuit upstream from the original plant.

With these revisions and new equipment, the previous 300-t.p.h. capacity of the operations has been raised about 30 percent. While the new flow averages approximately 350-t.p.h., a 400-t.p.h. rate has been maintained on numerous working days.

Designed specifically for this installation by Stephens-Adamson engineers, the new conveying system and the scalping and primary crushing circuit were completed in September, 1956. Construction was carried out by the local crew while operations in the old pit were drawing to a close.

Concurrently, erection of a new dragline was in progress on the site of the future pit. The new machine, a 5-cu. yd. Page 6-18, was acquired as replacement of two old railroad-type, steam-powered draglines which had been used for many years in the south pit.

In the new north pit, where operations were initiated about a year ago, the deposit averages 30 ft. in depth under an overburden of about 5 ft. Sand constitutes approximately 55 percent of the material in place. The balance of this glacial deposit, which is not very coarse, ranges up to a top size of about 6 in.

In the pit, both stripping and loading operations are carried out by the new dragline. Overburden is removed from the next day's digging area at the end of each daily loading shift during regular pit advance. The rail phase of the pit-to-plant haulage system is comprised of standard gauge trackage on which two trains of four cars each are operated. Up to 80 carloads have been loaded on one shift by the dragline.

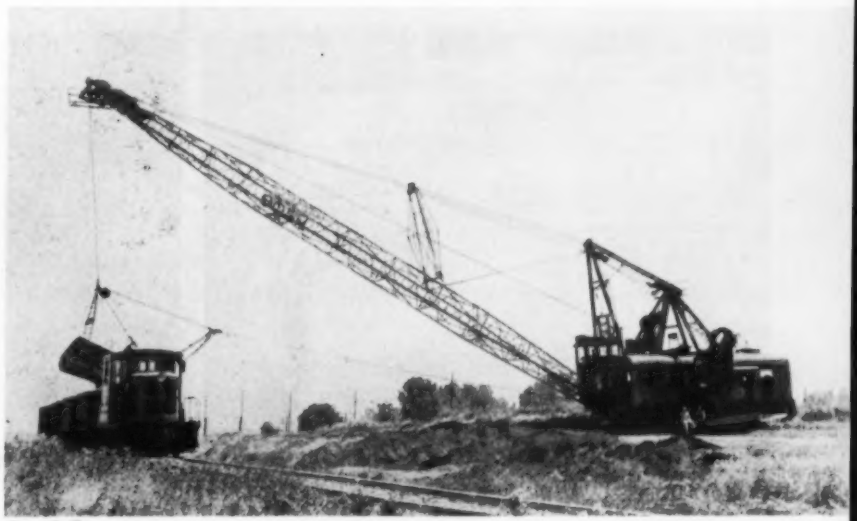
The 43-ton capacity bottom-dump cars are hauled to the rail-conveyor transfer point by 44-ton Whitcomb locomotives driven by Caterpillar D17000 diesels. At the transfer point, the cars are individually spotted over an under-track hopper from which, *via* gravity feed through a quadrant-type gate, the material is transferred to the new conveyor system.

The latter is comprised of two sections, A and B, which are 300 and 600 ft. long, respectively. Both carry 30-in. belting on 3-pulley, ball bearing carriers, and are driven at 300 f.p.m. by 40-hp. motors through Stephens-Adamson speed reducers. For ease of maintenance, grease fittings for all carrier bearings are accessible from the catwalk running the length of the system. These conveyors, as well as the bulk of the plant's equipment, are driven by General Electric motors.

Conveyor section A transports the pit-run material from the rail hopper, through a concrete tunnel below the mainline of the Milwaukee Railroad, to a transfer point for discharge to section B. In order to take advantage of the most natural route across the terrain between the rail hopper and the plant, with minimal excavation, a small change in direction was required, necessitating the installation of the conveyor in two sections.

The latter section discharges the material at the new scalping and crushing station ahead of the plant. Here the feed is passed over a 4- by 12-ft. single deck scalper that is fitted with 2½-in. square opening woven wire screencloth. Throughs from the scalper are chuted to the plant feed belt, while the oversize

At the top is the new scalping station, and to the left, the plant feed conveyor. Seen below, right, are two of the battery of gyratory crushers.



Erected on the site of the new pit, this 5-cu.-yd. dragline has loaded at the rate of 400 t.p.h., or 80 carloads on one shift.

is tranferred on a 24-in. belt to a No. 6 Gates gyratory crusher.

Minus 2-in. discharge from the latter is chuted to a return belt on which it is transferred to the plant feed belt. A closed circuit is not used —the crusher run joins the minus 2½-in. fraction from the scalper and is transferred on the 30-in. by 180-ft. feed belt to the plant.

At the top of the washing and screening plant, the feed is divided to a battery of three Cedarapids vibrating screens by a splitter box. These three screens, all horizontal 3- by 8-ft. double deck units, have 2-in. opening screencloth on their top decks. The bottom decks differ, with 1⅛-in. opening cloth on one (north), 1½-in. on another (center), and a split bottom deck of 1½- and 1¼-in. on the third (south) screen.

Gravel retained on both decks of all three screens is chuted to underlying bins from which it is drawn for transfer *via* belt conveyor to a pair of gyratories for secondary reduction. Product of the latter is returned to the plant feed belt in closing the secondary circuit. Bottom deck throughs from the above screens are chuted to a following lower group of three 42-in. by 10-ft. double deck vibrating screens, each of which is equipped with two spray bars.

Minus 1⅛-in. material from the top north screen is fed to one of the lower units which is fitted with a ⅜-in. opening top deck, and a split lower deck with $\frac{3}{16}$- and ¼-in. openings. The top middle screen feeds the lower middle screen that has a split top deck with ¼- and ⅜-in. openings, and a $\frac{3}{16}$-in. opening lower deck. Also fitted with a split top deck of ¼- and ⅜-in. openings, and a $\frac{3}{16}$-in. opening lower deck, the south lower screen is supplied from the corresponding upper screen.

The various fractions retained on both decks of each lower screen are chuted to the respective underlying bins as finished products. Throughs are flumed to a pair of wooden settling bins and then fed to an Eagle Iron Works 23-ft. classifier with twin 20-in. screws. An estimated 150 t.p.h. of material is discharged from the classifier to an inclined 24-in. by 150-ft. belt conveyor. The latter transfers the sand to a 24-in. by 180-ft. Stephens-Adamson stacking conveyor from which it is discharged to stockpile through a turnhead.

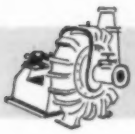
Finished products in the 20-in. bins below the washing plant are drawn upon for direct rail loading through chutes to adjoining tracks on each side, as well as for trucking to stockpile on the plant site. Rehandling for truck or rail loading is handled by two Manitowoc 1-cu. yd. clamshell cranes, and a pair of Browning

(*Continued on page* 129)

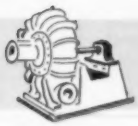
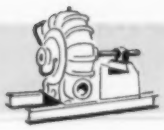
Right: A view of the plant showing the feed conveyor at right and bins below. The horizontal conveyor (center) distributes materials to the secondary crushers.

Below, right: At the left is Hans Anderson, plant superintendent. Joyce Anderson (center) is plant office manager; and Dave Hammond (right), is assistant general superintendent for all company operations.

Below: Looking down on one of the washing screens. Two groups of three screens each are installed in tandem.

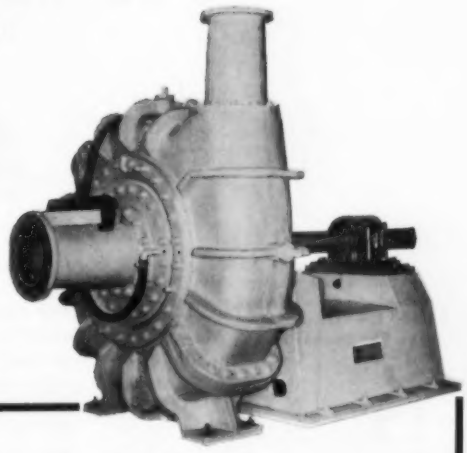


Another Customer Speaks

Mr. Tinker Puts His Experience With A Thomas Pump Into Two Words:——

"ASTONISHING DURABILITY"



No wonder Mr. Tinker is enthusiastic about the "astonishing durability" of his Series FL Thomas pump. There is a gleam in his eye when he compares his monthly repair bills on his old-style conventional pump, with the once-a-year repairs on his Thomas pump. A Thomas pump needs far less repair because its wearing parts are made of genuine Thomas Ni-Hard, and the pump is especially designed to complement the metal.

Tinker Sand & Gravel Company, producing sand and gravel on the Tennessee river, is growing. Mr. Tinker states he will need a larger pump next Spring, and he says: "Of course, it will be another Thomas."

So it is that, regardless of sizes of the operation, whether pumping from a river, lake or pit, the experience of Thomas pump users piles up proof that—

Tinker Sand & Gravel Company

J. L. TINKER, Manager

WASHED SAND & GRAVEL
Manufacturers of Concrete Building Blocks
Telephone 2671

PARSONS, TENNESSEE
August 26, 1957

Thomas Foundries, Inc.,
Birmingham, Alabama

Gentlemen:

In July 1955, we installed a Thomas Pump on our dredge. We are very pleased with the results. Its durability is astonishing.

With the old pump, we made monthly repairs --- now it is only necessary to make yearly repairs.

Of course, the elimination of the costly down time has pleased us very much. We are now able to meet the demands for sand and gravel by having stock piles large enough to take care of any rush job.

We are glad to recommend the Thomas Pump to anyone. They can't buy a better, long-lasting sand and gravel pump.

Yours very truly,

TINKER SAND & GRAVEL CO.

J. L. Tinker

"YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

THOMAS FOUNDRIES, *Inc.*

P. O. BOX 1111 . . . . BIRMINGHAM, ALABAMA

Blasting Techniques

In Seaway Quarry Aid High Production

BY CLAY LAMBERT,
Project Manager
Lambert Bros., Mills and Gorman, Inc.
Massena, N. Y.

AT THE Lambert Bros., Mills and Gorman, Inc., quarry near Massena, N.Y., 2,000,000 tons of aggregate are being produced for mass concrete construction on the St. Lawrence Seaway project. Early operating experience, under the conditions existing in this quarry, indicated that conventional gelatin dynamite was needed in order to maintain the required high production rate.

It should be apparent that the actual result of using any type of explosive can only be determined in terms of the production efficiency of the overall operation. The relative costs of the explosives alone is only a small part of the picture. When less expensive ammonium nitrate blasting agents—which will do the job in many places—were tried in this deposit, the breakage looked all right and powder costs were cut in half, but production dropped more than one-quarter and the overall production cost per ton increased. This higher cost was caused not only by the lower production rate with the same fixed operating expenses, but by an increase in the maintenance required by hauling and crushing equipment as a result of handling excessive oversize material. In this quarry, at least, the cheapest way to break rock seems to be by shooting it hard in the primary blast.

High production in a relatively short time is the most important consideration at this quarry. Later this year, after only two short working seasons, over 2,000,000 tons of mass concrete aggregate will have been shipped to contractors working on the Seaway. Last year, 1,000,000 tons were shipped in 100 two-shift working days. To produce at this rate, shooting with powerful fixed high explosives has proved to be the most efficient practice.

Three operating levels are visible in this panoramic view of the Lambert Bros., Mills and Gorman quarry near Massena, N.Y.

The Pit In order to understand the blasting technique used, the manner in which the pit has been developed should be first understood. This phase was undertaken before the first of May, 1956.

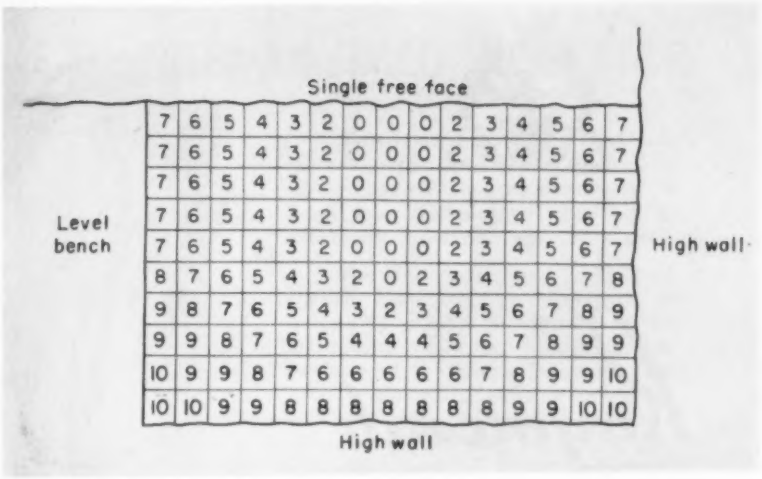
The 177-lb. per cu-ft. dolomite limestone is overlain by about 9 ft. of tough, greasy blue marine clay. This sticky, plastic material is prevalent throughout this section of the St. Lawrence River Valley and has caused huge headaches to every contractor excavating in the area. It is considered responsible for one contractor's failure, and another's default. After tediously stripping 20 acres of the quarry site with draglines, scrapers, and dozers, it was decided that this would be discontinued, and to get our rock we would go straight down. In addition to the difficult stripping, another factor influencing this decision was the extreme abrasiveness of the cap rock. By developing the quarry downwards there would be no more of this troublesome material to handle after the initial lift.

The quarry is presently being worked in three lifts, each 25 to 30 ft. deep. Rock bottom is now 80 ft. below the surface and will probably be the final floor of the pit. To start each level a sinking shot was fired first. After that, nearly every shot pattern has been generally rectangular, extending far back from a single face. Thus, most holes are "tight" holes in comparison to those in the normal quarrying row-of-holes method.

In order to get the volume and breakage necessary for high production, a U-shaped millisecond delay blasting pattern is used. The front and center of the shot pulls first to provide a progressively opening U-shaped face in the center of the shot area to which each later detonating ring of holes can shoot in sequence. A typical pattern is shown in an accompanying diagram. The number of holes may vary from shot to shot but the same basic pattern is used throughout.

Drilling Holes are drilled with equal (16 ft.) spacing and burden, because after the center "plug" is pulled, what would normally be the spacing becomes the burden, and vice versa. Two Ingersoll-Rand Quarrymaster drills, working two 8-hour shifts daily, sink 6-in. diameter holes to a depth 3 ft. below the floor of the lift to insure pulling down to the next level. Actual depth of holes ranges from 28 to 33 ft.

In addition, an Ingersoll-Rand Drillmaster down-the-hole drill has recently been put into action sinking deeper holes in rows along the perimeter of the highwall around the pit, in order to recover the narrow belt of rock by-passed in sinking the pit proper.



This diagram of a typical blasting pattern used in this quarry shows the group of 0-delay holes, which, when shot, unplug the tight pattern. This gives the subsequent progressively fired U-shaped patterns a face to shoot to.

Blasting Holes are loaded with Atlas 60 percent Giant Gelatin in 25-lb., 5½-in. diameter cartridges. Atlas Rockmaster caps, delays 0 through 10, are used to prime the bottom cartridge in each hole. Detonation at the bottom of each hole thus confines the energy of the explosion as long as possible within the burden where it works on the rock instead of escaping prematurely into the air where it would be wasted. Holes are loaded to about 10 ft. of the surface and stemmed with rock cuttings. The normal powder factor, 2½ tons of rock per pound of explosive, may seem a little heavy, but it provides the fragmentation desired.

Excellent breakage and a high heaped pile are the results of this type of shooting. A drop ball, suspended from a Model 6 Northwest crane, is used for secondary breakage, but it need operate an average of only four hours a day. The high pile digs and feeds easily, and presents no safety hazard because of the excellent fragmentation and the absence of big boulders.

(*Continued on page* 129)

A reclaiming tunnel conveyor discharging 6-in. aggregate to a bottom-dump haulage unit for delivery to the locks.

Raymond ROLLER MILL with Whizzer Separation and Flash Drying

DYNAMIC MODERN DESIGN of the Raymond Roller Mill gives you important new economies in production.

This complete pulverizing unit combines: Whizzer separation with simplified fineness control . . . . pneumatic feed control to maintain maximum mill capacity . . . self-lubricating roller journals for reducing lubrication costs . . . . throw-out attachments for rejecting impurities; also for making two grades simultaneously: granular product with a minimum of fines and the normal finely divided product from the cyclone collector.

The Mill serves a double purpose when built with integral Flash Drying accessories for removal of surface moisture while pulverizing. By the same system, fresh air may be introduced into the mill for cooling action . . or a neutral gas used with special equipment as in the grinding of sulphur.

The ease of installing the Roller Mill to fit an existing plant layout, its flexibility in application, its automatic dust-free operation with a record low cost of maintenance, make the Raymond Roller Mill a sound investment for modern plants.

Typical set-up of Roller Mill with piping, collectors, and package type furnace for supplying heat to system for Flash Drying.

Tell us your pulverizing requirements. Raymond engineers can determine what the Roller Mill can accomplish for you by running laboratory tests on your material. Catalog will be sent on request.

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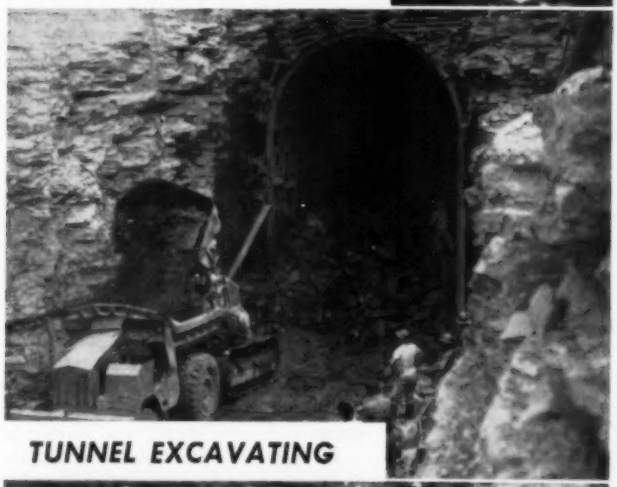
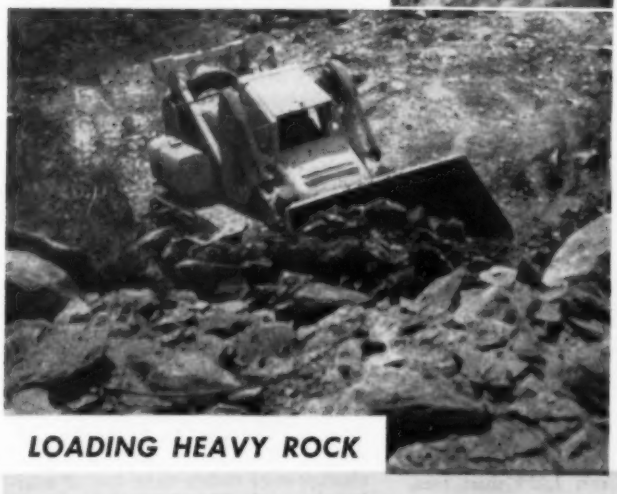
IN SPOTS LIKE THESE YOU NEED AN EIMCO EXCAVATOR

TIGHT QUARTERS



TUNNEL EXCAVATING



LOADING HEAVY ROCK

Illustrated are just three job conditions where 105 Eimco Excavators outperform other earthmovers. It takes care of the tough jobs just as efficiently as it does the easy ones.

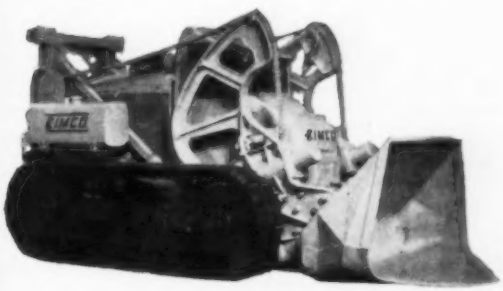
The knowledge and experience gained from building thousands of underground loaders was used to full advantage when we designed and engineered the Eimco Excavator. We gave it the same extra strength for severe service; increased the life and efficiency of working parts thru simplification; gave it I.T.R. (independent track reversal) mobility and "passenger car" power-shift operating ease. Then we put the operator up front where he can see what's going on.

Overhead discharge speeds cycle time; makes it possible to dig, load and dump from one position and do road-work without stopping highway traffic.

With powerful crowding action (39,000 lbs.) the Eimco 105 loads large rocks without secondary blasting usually required when boom shovels or other loaders are on the job.

The Eimco 105 Front-End Loader combines this same high tractor mobility with front end loading versatility for handling scores of different jobs economically.

Write for information on the Eimco 105 Tractor Excavator or Front-End Loader . . ideal highway building tools.



EIMCO 105 EXCAVATOR

THE EIMCO CORPORATION

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B-295

Preliminary 1956 Mineral Report On Western States, Alaska, Hawaii

Nevada

The value of Nevada's mineral production is 1956 reflected the increased output of her copper industry, in turn aided by a higher average market price as compared to the previous year. In general the nonmetallic field remain substantially on a par with 1955 producution. Slight declines were noted in the outputs of some commodities directly related to dwelling construction, although sharp advances in production were shown by brucite, clay, magnesite and stone.

Nonmetals — Pacing construction and industrial development in the state, the production of sand and gravel moderately increased over the previous year. The increased use of these commodities for asphaltic concrete and as aggregate was, in part, responsible for this gain. The production of sand for the manufacture of glass has been an added stimulus to the sand industry and represents a significant part of the value. Conforming to this trend, crushed sandstone made a substantial advance in the stone industry production. Crushed granite, another important and locally abundant product, played an increasingly greater role in construction. The production of gypsum declined this year, conforming with the decrease in new home construction.

Magnesium mineral production increased substantially. Magnesite was utilized at the magnesia plants in the state, while brucite was shipped to eastern plants. Perlite and fluorspar gained slightly in production while pumice and volcanic cinders output dropped to one-third of the previous year's production. The slacking off in new home construction utilizing lightweight aggregate and the curtailed use of volcanic cinders for road construction were responsible for this decline.

Although a substantial increase in its production occurred in 1955, the yield of talc, pyrophyllite, and soapstone in 1956 remained virtually the same as the previous year.

Mineral Production in Nevada, 1955, and 1956 (estimate)[1]

Commodity	1955 Short Tons (unless otherwise stated)	1955 Value	1956 (estimate) Short Tons (unless otherwise stated)	1956 (estimate) Value
Metals				
Copper (recoverable content of ores, etc.)	78,925	$58,878,050	82,500	$ 69,135,000
Gold (recoverable content of ores, etc.), troy ounces	72,913	2,551,955	68,600	2,401,000
Iron ore (usable), long tons, gross weight	324,602	1,667,098	860,700	4,424,000
Lead (recoverable content of ores, etc.)	3,291	980,718	6,000	1,920,000
Ferruginous manganese ore (10 to 35 percent Mn), gross weight[2]	.....	.....	.....	.....
Mercury, 76 pound flasks	5,750	1,669,512	5,800	1,508,000
Silver (recoverable content of ores, etc.), troy ounces	845,397	765,127	950,000	860,000
Tungsten concentrate, 60-percent WO_3 basis	6,155	22,750,662	4,800	17,123,000
Zinc (recoverable content of ores, etc.)	2,670	656,820	6,900	1,863,000
Undistributed: 1954-55 and 1956 estimate, antimony ore and concentrates (1954), manganese ore[3] and molybdenum		7,409,037		8,656,000
TOTAL		$97,328,979		$107,890,000
Nonmetals				
Barite (crude)	113,694	$ 708,804	124,000	$ 770,000
Clays	6,155	13,385	12,500	16,000
Gypsum	836,744	2,835,922	750,000	2,625,000
Sand and gravel	3,580,260	3,762,384	3,760,000	3,950,000
Stone	[4]1,611,942	[4]2,608,900	[4]1,930,000	[4]3,090,000
Talc and soapstone	10,732	90,086	10,000	90,000
Undistributed: 1955, and 1956 estimate, brucite (1954 & 56), diatomite, fluorspar, gem stones, lime, magnesite, calcareous marl (1954-55), perlite, pumice, pumicite and volcanic cinders, salt and sulphur ore (1955-56)		6,342,697		6,527,200
TOTAL		$15,792,016		$ 16,393,200

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2] Shipments to government low-grade depots and custom mills not included, but quantity and value for this material is as follows: 1954-manganese ore, 872 short tons, $63,775, and ferruginous manganese ore, 1,187 short tons, $45,812; 1955-manganese ore, 3,213 short tons, $262,142, and ferruginous manganese ore, 1,254 short tons, $50,278.

[3] Includes 283,156 short tons of limestone used in lime valued at $570,162.

[4] The total has been adjusted to eliminate duplication in the value of stone included in lime.

[5] Includes 340,000 short tons of limestone used in lime valued at $675,000.

California

California's mineral production continued its advance in 1956 as a direct reflection of the mineral fuel output. The decline in pyrite production was due to an operational change-over rather than loss of market demand. The field of nonmetallics in general, reflected a healthy condition although there were production declines in gypsum and lime —largely the result of a decrease in new construction.

Nonmetals—An upward trend in the production of talc, pyrophyllite, and soapstone has been brought about through utilization of heretofore unsuitable grades. Due to competition with other raw materials, however, the gain was smaller than that of the previous year.

Pacing industrial growth, the production of diatomite in the state continued to increase. Used primarily as a filter aid, fillers, insulation, and abrasives, there has been growth in its use as a simple aggregate in the manufacture of pressed brick, containing a binder. Natural aggregate and calcined aggregate are also made and sacked. California leads the nation in the production of diatomite.

A substantial gain in both production and value of cement occurred in 1956. Second only to petroleum products in value, this cement production reflects the growing impetus on construction and industrial activity. While new housing construction has substantially decreased over the previous year, the expansion of industrial and road programs and the accelerated utilization of lightweight aggregate products has led to a pronounced increase in output. To meet this new demand, California's industry has begun construction on one new cement plant, the expansion of three others and placed one plant in production in 1956 for the first time.

As the nation's No. 1 producer of sand and gravel, California continued its moderate, upward trend of production. With many problems of transportation involving zoning laws and new and changing product requirements, this highly competitive industry has characterized its growth by readjusting its manufacturing processes to the economic demand. The number of portable rock crushers has increased substantially this year, thus affording the small operator the advantage of a local market. The two non-portable gravel plants have been constructed this year. One will utilize the waste from a placer gold operation in conjunction with other crushed stream gravel, and the other is the first operation in the West to use the sink-float method of production. Output of volcanic aggregates continued a trend of gradual growth by additional utilization in the construction industry. The stone industry remained at about the 1955 level of production.

Clay in California increased moderately in both production and value. Bentonitic clay and fuller's earth in particular have found new and expanding uses in the economy.

Salines, as a group, contributed a noteworthy percentage of California's

Mineral Production in California, 1955 and 1956 (estimate)[1]

Commodity	1955 Short Tons (unless otherwise stated)	1955 Value	1956 (estimate) Short Tons (unless otherwise stated)	1956 (estimate) Value
Metals				
Chromite—gross weight	22,105	$ 1,834,277	25,000	$ 2,074,500
Copper (recoverable content of ores, etc.)	613	457,298	800	670,000
Gold (recoverable content of ores, etc.) troy ounces	251,737	8,810,795	194,800	6,818,000
Iron ore (usable) long tons, gross weight	1,776,536	[3]	2,375,000	[3]
Lead (recoverable content of ores, etc.)	8,265	2,462,970	10,000	3,200,000
Manganese ore (35 percent or more Mn) gross weight	3,136	270,519	6,200	424,000
Mercury, 76-pound flasks	9,875	2,867,206	8,500	2,210,000
Silver (recoverable content of ores, etc.), troy ounces	954,181	863,582	966,000	874,000
Tungsten concentrate, 60-percent WO_3 basis	4,383	16,200,924	3,900	14,150,000
Zinc (recoverable content of ores, etc.)	6,836	1,681,656	8,100	2,187,000
Undistributed		15,964,204		21,358,500
TOTAL		$ 51,413,431		$ 53,966,000
Nonmetals				
Boron minerals	924,496	$ 24,357,723	1,000,000	$ 29,000,000
Cement, 376-pound barrels	35,084,415	103,793,702	38,000,000	117,000,000
Clays	[2]2,860,395	[2]5,027,381	[6]2,920,000	[6]5,130,400
Gypsum	1,307,625	3,273,724	1,100,000	2,750,000
Lime (open market)	268,009	4,372,789	210,000	3,465,000
Magnesium compounds from sea water and bitterns (partly estimated) MgO equivalent	60,839 [3]	3,894,432 [3]	70,000 [3]	4,480,700 [3]
Marl, calcareous				
Perlite	15,653	125,113	16,000	128,000
Pumice, pumicite and volcanic cinders	797,306	1,099,459	800,000	1,040,000
Salt (common)	1,314,835	6,751,420	1,250,000	6,500,000
Sand and gravel	64,815,806	66,351,853	66,000,000	66,000,000
Stone	[4]24,726,276	[4]37,893,386	[7]25,000,000	[7]37,447,500
Strontium minerals	177	4,425	[3]	[3]
Sulfur ore, long tons	199,599	[3]	195,000	[3]
Sulfur (byproduct - brimstone, H_2S & SO_2) long tons contained	136,792	3,829,049	136,800	3,829,000
Talc, pyrophyllite and soapstone	166,551	1,552,783	170,000	1,584,400
Titanium, iron concentrates (non-titanium use)	[3]	[3]	[3]	[3]
Undistributed: 1955 and 1956 estimate, asbestos, barite, bromine, calcium-magnesium chloride, diatomite, feldspar, fluorspar (1955), garnet, gem stones, iodine, lithium minerals, magnesite, mica (flake), potassium salts, pyrites, quartz from pegmatites and quartzite[5], ground sand and sandstone, slate, sodium carbonate, sodium sulphate, and minerals where value must be concealed for particular years (included in appropriate column by footnote reference[3])		37,392,339		39,184,400
TOTAL		$282,483,831		$301,020,900

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2] Includes 758,931 short tons, $804,313, clay sold or used in cement.
[3] Included with "Undistributed."
[4] Includes 10,462,734 short tons of limestone used in cement valued at $15,514,339 and 514,818 tons of limestone used in lime valued at $917,095.
[5] Item no longer carried. Material included in sand and gravel and stone.
[6] Includes 773,800 short tons, $821,000, clay sold or used in cement.
[7] Includes 9,975,000 short tons of limestone used in cement valued at $14,763,000 and 525,000 short tons of limestone used in lime valued at $934,500.

total production, and (with the exception of common salt and calcium chloride) a substantial increase in production occurred in 1956. The dry lake regions of Inyo, Kern, and San Bernardino counties accounted for the production of most of the saline minerals. Open-pit mining has replaced underground methods in the recovery of many of the salts, and one new plant has been constructed; several others have been expanded.

Due to the competition with magnesium oxide recovered from sea water in California, the production of magnesite ore continued to decline this year. Formerly one of the principal domestic producers of magnesite, California now leads the nation in the production of magnesium compounds from sea water and has continued its upward trend of production.

Oregon

Mineral production in Oregon increased 7 percent in 1956 and was valued at more than $34,000,000, a new record for the state. Increased output of metallic ores, with nickel, chromite, and mercury registering major gains, and greater production of cement more than offset a decline in the volume of sand and gravel, and stone. A cement shortage was alleviated through installation of new capacity, and further expansion in production of this commodity was expected. Accelerated output of some primary metal and nonmetal products is not reflected in the table because the raw materials used at the manufacturing plants were obtained from out-of-state sources.

Decreased output by contractors for the United States Army Corps of Engineers at The Dalles Dam on the Columbia River was a major factor in the decline in sand and gravel and stone production. Concrete pouring at the dam was largely completed in 1956, and riprap work was to be finished in 1957. Most of the cement used at the project was imported from out of state. A drop of 15 percent in tonnage of up-river barge traffic from Portland was due principally to a decline in cement shipments to The Dalles.

Nonmetals—Production and shipments of portland cement continued the upward trend established in the years just preceding and registered an increase of 14 and 12 percent, respectively, over the 1955 levels. End of the year stocks of portland cement were considerably higher than for 1955. A general increase in price was reported by companies producing portland cement. The price advance was in line with the upward trend of cement prices nationally as announced in January by many of the major cement-producing companies. Average price for cement reported shipped by producers in Oregon and Washington was about 25 cents a barrel above the 1955 average.

Sand and gravel production, in terms of tonnage and value, was again the most important mineral commodity produced.

Gross output of 11,600,000 tons of sand and gravel, valued at $11,600,000, was reported for 1956. This represented a decrease of 3 percent, compared with the 1955 production of 11,900,000 tons, valued at $11,800,000. Commercial producers accounted for 8,200,000 tons, valued at $8,400,000, during 1956, compared with the previous year's output of 6,800,000 tons, valued at $7,400,000. Government-and-contractor production was credited with 3,400,000 tons, valued at $3,200,000, in 1956, compared with the 1955 total of 5,100,000 tons, valued at $4,400,000.

Sixty-four percent of the total output of 11,600,000 tons of sand and gravel in the state during 1956 was used for road-building and maintenance purposes, 29 percent for building and construction projects, and the remaining 7 percent for other miscellaneous applications.

Gross output of 6,100,000 tons of stone, valued at $7,900,000, was reported for 1956. This was a drop of 21 percent in output and 16 percent in value, compared with 1955. Decreased consumption by the Oregon State Highway Department was the principal cause for this large decline. Commercial production of 3,300,000 tons, valued at $4,700,000, and government-and-contractor output of 2,800,000 tons, valued at $3,200,000, were recorded during the year. Comparable figures for 1955 were commercial, 3,300,000 tons ($4,300,000), and government-and-contractor, 4,400,000 tons ($5,100,000). In terms of tonnage, about 69 percent of the total stone produced was used for construction and maintenance of roads.

Output of crushed limestone in 1956 totaled 960,000 tons, an increase of 17 percent over the 821,000 tons recorded in 1955. The largest single consumer of crushed limestone during 1956 was the cement industry. Other consuming industries, arranged in order of quantity used, were sugar refineries, and paper, calcium carbide, and metallurgical plants; smaller amounts were used for agricultural applications.

Washington

Final production totals for Washington's commodities disclosed that value of output dropped by nearly

Mineral Production in Oregon, 1955-1956[1]

Mineral	1955 Short Tons (unless otherwise stated)	1955 Value	1956 Short Tons (unless otherwise stated)	1956 Value
Chromite, gross weight	5,341	$ 463,514	54,577	$ 2,001,083
Clays	250,608	275,916	256,942	278,205
Copper (recoverable content of ores, etc)	4	2,984	7	5,950
Gold (recoverable content of ores, etc.), fine ounces	1,708	59,780	2,738	95,830
Iron ore (limonite)	2,000	2	1,893	2
Lead (recoverable content of ores, etc.)	3	894	5	1,570
Mercury, 76-pound flasks	1,056	306,610	1,893	492,029
Nickel ore, nickel content	4,181	2		
Sand and gravel	11,953,878	11,832,344	6,866	2
Silver (recoverable content of ores, etc.), fine ounces	8,815	7,978	11,637,183 13,537	11,646,367 12,252
Stone	7,741,937	9,417,834	6,097,965	7,890,197
Tungsten (recoverable content of ores, etc.), 60 percent WO_3 basis	1	2	2	2
Value of items that cannot be disclosed: Carbon dioxide, cement, coal (1955), diatomite, gem stones, mineral pigments (1956), pumice and values indicated by footnote [2]		10,504,356		12,929,235
TOTAL	[3]	$31,740,000	[3]	$34,011,000

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Figure withheld to avoid disclosure of individual company confidential data.
[3]Total has been adjusted to eliminate duplication in the value of clays and stone.

$5,800,000 in 1956. Metals supplied 26 percent of the total value and nonmetals and fuels 74 percent. Most of the decline was due to a decrease of $5,500,000 in production of nonmetals and fuels, principally sand and gravel, cement, and coal. Production of lime, and talc and soapstone also declined. Stone output was up in 1956, as were several other commodities of smaller total value, including clays, diatomite, gypsum, olivine, and peat.

Production and shipments of cement decreased about 11 percent and 17 percent, respectively, compared with 1955. Year-end stocks were slightly higher than at the close of the last year. A slowdown in construction of dwellings and commercial structures figured prominently in the slackened demand for this commodity. Companies producing portland cement reported a general price increase which was in line with the upward trend nationally. Average price for cement shipped by Washington and Oregon producers was about 25 cents a barrel above 1955 average. This price advance was offset by higher wages, fuel oil costs, and freight rates.

A decrease of 22 percent was recorded in output of sand and gravel, as compared with 1955. The total production of 16,800,000 tons, valued at $15,000,000 was distributed between commercial, 8,800,000 tons ($8,300,000), and government-and-contractor, 8,000,000 tons ($6,700,000). Completion of major construction at The Dalles and Chief Joseph dams by the United States Army Corps of Engineers resulted in a 5,400,000 ton drop in sand and gravel used by that agency. This decline was offset somewhat by an increase of 1,400,000 tons by the Washington State Highway Department. The net result was that decrease in the government-and-contractor category represented 3,700,000 of the total 4,800,000 ton deficit for 1956. Commercial production comprised the balance of 1,100,000 tons.

Gross output of stone in 1956 was 8,000,000 tons valued at $11.6 million, compared with 6,600,000 tons worth $10,600,000 in 1955. The total was divided between commercial, 4,300,000 tons ($7,800,000) and government-and-contractor, 3,700,000 tons ($3,800,000). Comparable figures for 1955 were commercial, 3,900,000 tons ($8,000,000), and government-and-contractor, 2,700,000 tons ($2,600,000). The commercial advance (400,000 tons) was brought about by large gains in output of basalt for road metal, railroad ballast, and riprap; and crushed granite for riprap and rubble; and smaller advances for sandstone, mainly for metallurgical purposes; and marble for terrazzo and roofing granules. In contrast limestone production was about 11 percent below the 1955 level. In the government-and-contractor category, the increase (1,000,000 tons) was attributed mainly to a larger quantity of stone used by the United States Army Corps of Engineers for riprap, road metal, and miscellaneous purposes. Substantial gains also weremade by the Washington State Highway Department and the Bureau of Reclamation.

Mineral Production in Washington, 1955-1956[1]

Mineral	1955		1956	
	Short Tons (unless otherwise stated)	Value	Short Tons (unless otherwise stated)	Value
Barite	25	$ 250	—	$ —
Clays	365,331	411,807	319,988	436,558
Coal	[2]609,790	4,263,030	[2]473,088	[3]
Copper (recoverable content of ores, etc.)	3,958	2,952,668	2,926	2,487,100
Chromite, gross weight	22	1,706	30	3,330
Epsomite	100	5,000	[3]	[3]
Gold (recoverable content of ores, etc.), fine ounces	74,360	2,602,600	70,669	2,473,415
Gypsum (crude)	3,500	14,000	[3]	[3]
Lead (recoverable content of ores, etc.)	10,340	3,081,320	11,657	3,660,298
Peat	37,640	113,254	37,043	128,964
Pumice and pumicite	[3]	[3]	5,291	14,757
Sand and gravel	21,645,161	19,350,682	16,841,792	15,037,128
Silver (recoverable content of ores, etc.), fine ounces	436,348	394,917	448,442	405,863
Stone	6,593,212	10,579,631	8,057,338	11,659,598
Tungsten (recoverable content of ores, etc.) 60 percent WO_3 basis	12	45,949	[3]	[3]
Zinc (recoverable content of ores, etc.)	29,536	7,265,856	25,609	7,016,866
Value of items that cannot be disclosed: Abrasive stone, carbon dioxide, cement, diatomite, gem stones, iron ore, lime, magnesite, olivine, strontium (1956), talc and soapstone, and values indicated by footnote [3]		19,765,194		21,098,526
TOTAL		[4]$67,334,000		[4]$61,575,000

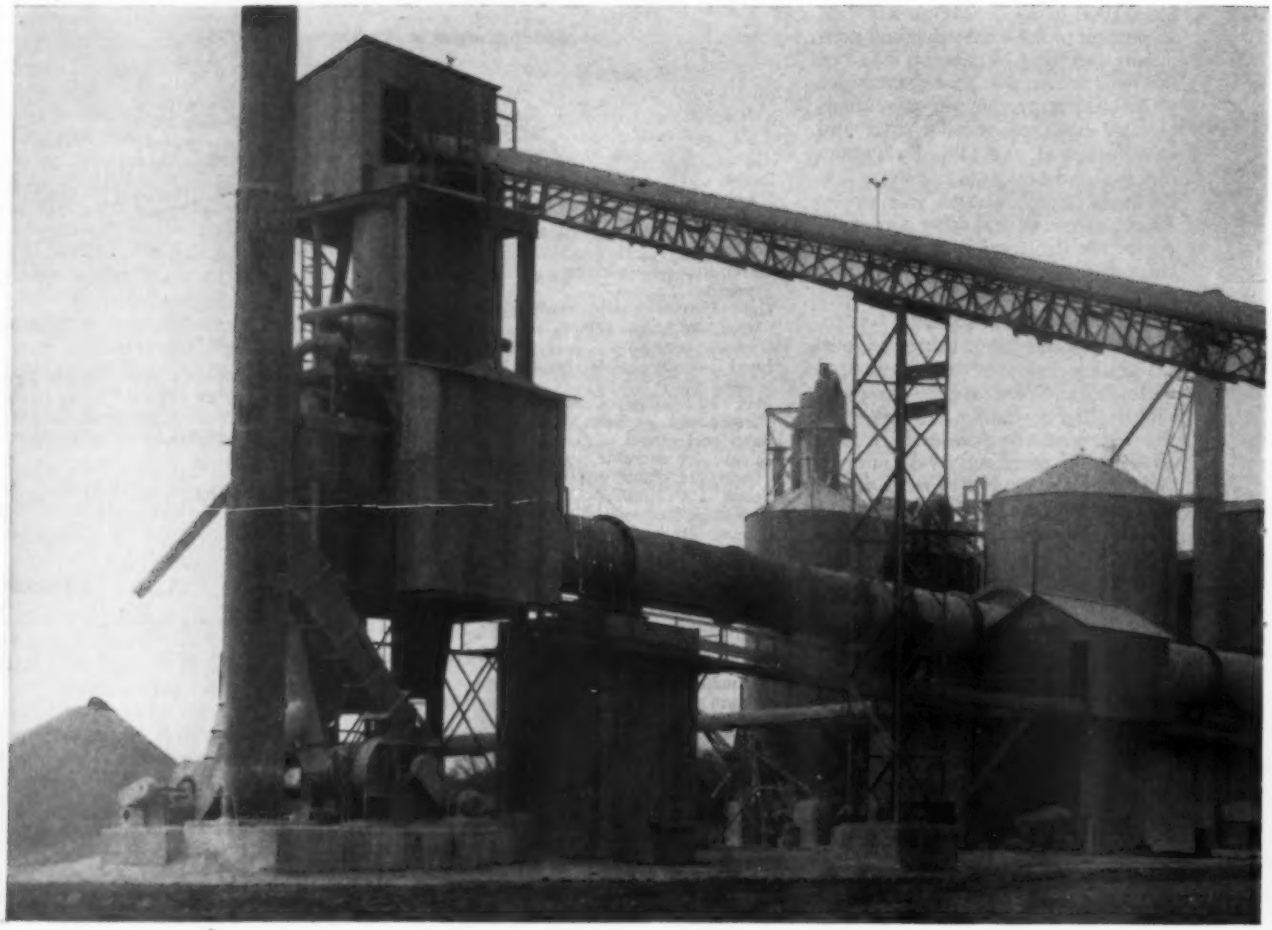
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Some minerals that originate in Washington cannot be credited owing to lack of information.
[2]Preliminary figures.
[3]Figure withheld to avoid disclosure of individual company confidential data.
[4]Total has been adjusted to eliminate duplication in the value of clays and stone.

Idaho

Value of mineral production in Idaho increased $7,000,000 in 1956. In nonmetals, gains in value for phosphate rock stone, and sand and gravel totalled $3,100,000. Output of cement declined, and moderate increases were made by barite, and pumice and pumicite. The continued increase in phosphate rock mining resulted from activation of a new mine as well as increased tonnage from one of the established operations.

Output of marketable phospate rock in Idaho advanced to 1,400,000 long tons in 1956, a rise of 8 percent over the 1955 level of production. This was the fourth consecutive year in which production of this commodity increased in the state. Phospate rock sold or used during 1956 totaled 1,200,000 long tons. This was an increase of 8 percent over the 1,100,000 long tons reported sold or used in 1955. The largest single use of phosphate rock mined in the state was for the manufacture of elemental phosphorus; smaller quantities were used in making phosphoric acid, and triple superphosphate and superphosphate fertilizers.

Gross output of 7,900,000 tons of sand and gravel, valued at $5,700,000, was recorded for 1956. This was a decrease of 9 percent in tonnage and an increase of 44 percent in total value of sand and gravel produced. In 1956 commercial produ-



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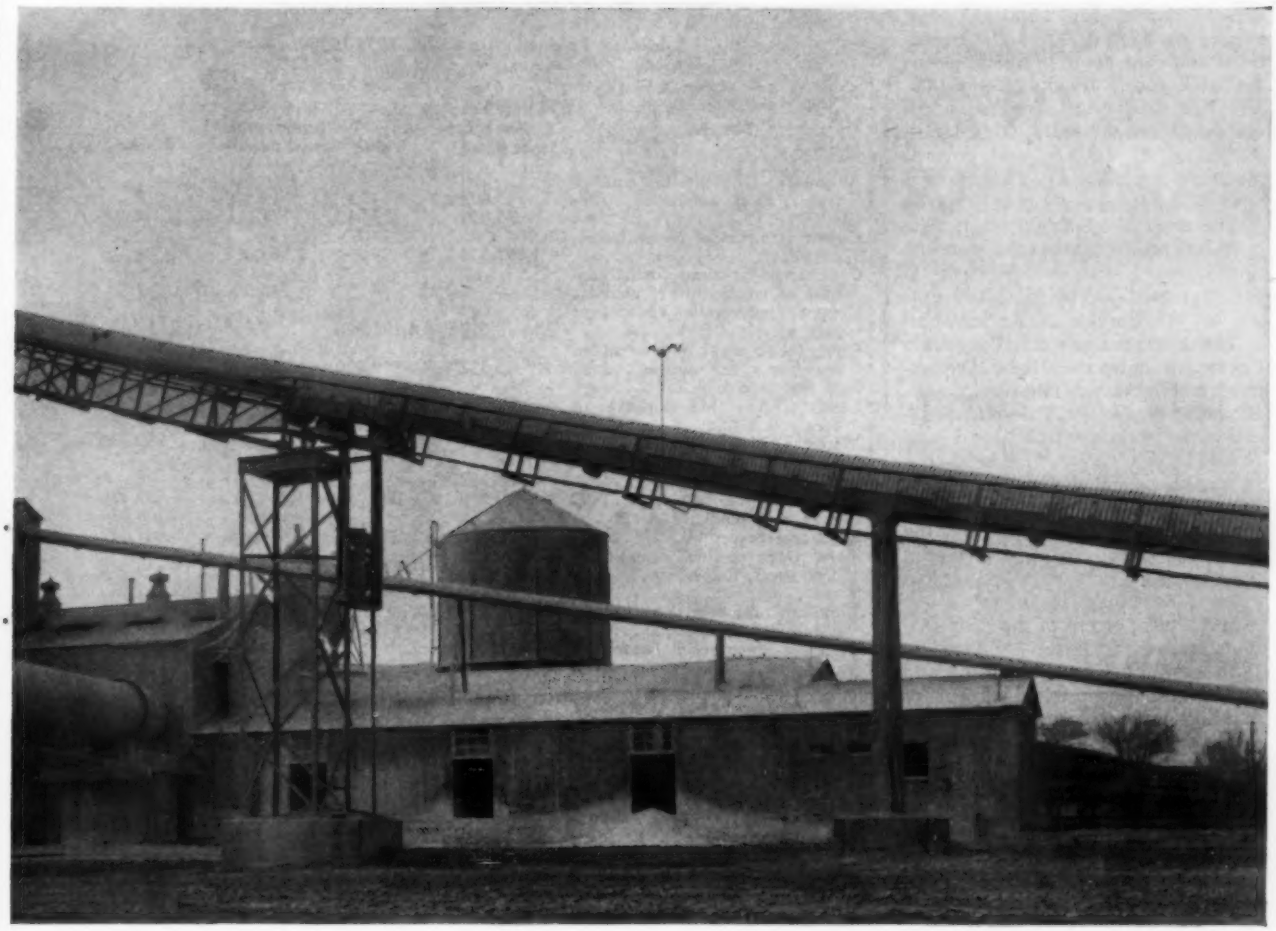

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cers accounted for 2,500,000 tons, valued at $2,400,000, and government-and-contractor production was 5,400,000 tons, valued at $3,300,000. In 1955 production from commercial operations totaled 1,700,000 tons, valued at $1,500,000, and government-and-contractor production was 6,900,000 tons, valued at $2,400,000.

The drop of 1,600,000 tons in the government-and-contractor production category was due primarily to the decreased use of sand and gravel by the Bureau of Reclamation at the Palisades project, Bonneville County, and by the Idaho Department of Highways. The rise in overall value during 1956 despite a decrease in tonnage produced was caused by the quality of material contracted for by the State Highway Department. There was a large increase in the quantity of prepared sand and gravel and a decrease in the quantity of lower value pit-run material used by this agency.

Sixty-four percent of the 7,900,000 tons of sand and gravel produced in 1956 was used for road-building and maintenance purposes, 30 percent for building and construction projects, and the remaining 6 percent for other miscellaneous uses including railroad ballast, and special railroad and construction sands. Production was recorded from operations in 36 of the state's 44 counties.

Output of 1,800,000 tons of stone, valued at $2,700,000, was reported for 1956. This represented increases of 17 percent in tonnage and 47 percent in value, compared with the previous year. A rise in the quantity of crushed stone used for road building and maintenance by the Idaho Department of Highways was the principal reason for the increase.

Fifty-nine percent of the 1,800,000 tons of stone produced in 1956 was used for road building and maintenance purposes compared with 51 percent for 1955. Production of stone was reported from operations in 16 of the state's 44 counties.

Mineral Production in Idaho, 1955-1956[1]

Mineral	1955 Short Tons (unless otherwise stated)	1955 Value	1956 Short Tons (unless otherwise stated)	1956 Value
Antimony (content of concentrate), gross weight	633	[2]	549	[2]
Clay	35,003	$ 29,910	[2]	[2]
Cobalt (content of concentrate), pounds	1,691,334	[2]	2,385,013	[2]
Columbium-tantalum (oxide content of concentrate), pounds.	[2]	[2]	215,900	[2]
Copper (recoverable content of ores, etc.)	5,618	4,191,028	6,656	$ 5,657,600
Gold (recoverable content of ores, etc.), fine ounces	10,572	370,020	10,029	351,015
Iron ore (usable)	—	—	800	[2]
Lead (recoverable content of ores, etc.)	64,163	19,120,574	64,321	20,196,794
Mercury, 76-pound flasks	1,107	321,417	3,394	882,168
Nickel (content of concentrate), pounds	65,782	[2]	98,495	[2]
Phosphate rock, long tons	1,329,959	6,038,088	1,438,151	6,539,436
Pumice and pumicite	[2]	[2]	101,913	206,064
Sand and gravel	8,652,138	3,933,876	7,874,460	5,661,417
Silver (recoverable content of ores, etc.), fine ounces	13,831,458	12,518,168	13,471,916	12,192,764
Stone	1,524,810	1,866,076	1,791,077	2,752,148
Titanium concentrate, gross weight	1,330	7,000	48,619	[2]
Tungsten (recoverable content of ores, etc.) 60 percent WO_3 basis	642	[2]	582	[2]
Zinc (recoverable content of ores, etc.)	53,314	13,115,244	49,561	13,579,714
Value of items that cannot be disclosed: Barite, cement, abrasive garnet, gem stones, gypsum (1955), mica (1955), peat (1955), and values indicated by footnote [2]. Excludes value of limestone used in the manufacture of cement		6,712,332		7,131,873
TOTAL		$68,224,000		$75,151,000

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Some minerals that originated in Idaho cannot be credited owing to lack of information.
[2]Figure withheld to avoid disclosure of individual company confidential data.

Montana

Total value of mineral production ($211,000,000), continuing the rapid increase begun in 1955, advanced by more than one-fourth and exceeded $200,000,000 for the first time in Montana's history. Copper and petroleum, which together supplied 64 percent of the state's mineral value, were responsible for the bulk of the $44,000,000 increase. Net gain in production of mineral products other than copper and petroleum was $5,000,000. Several commodities advanced significantly in output, including gold, fluorspar, lead, phosphate rock, silver, zinc, and cement. Production volume of sand and gravel was down and stone declined slightly; but the values for these commodities increased substantially.

The sharp decline in sand and gravel output and the small decrease in stone production resulted from completion of the Bureau of Reclamation Tiber Dam, which used huge tonnages of bank-run sand and gravel and broken stone as fill material. However, production of prepared sand and gravel and crushed stone, as well as cement output, was up in 1956, owing primarily to expanded highway construction. Other heavy-construction projects which used large quantities of construction materials were the new air base at Glasgow, expansion of air-base facilities at Great Falls, and the Sidney steam-electric plant.

Output of a little over 10,000,000 tons of sand and gravel was about 27 percent less than the 1955 total. In contrast, the value of this production ($7,200,000) advanced 8 percent. Distribution between commercial and government-and-contractor was 3,000,000 tons ($3,200,000) and 7,000,000 tons ($4,000,000), respectively. The quantity of commercial sand and gravel recorded in 1956 was almost 1,000,000 tons greater than in 1955, while output in the government-and-contractor category declined 4,700,000 tons. Operations in 34 of the state's 56 counties contributed to the output.

It was expected that the fall-off in demand for sand and gravel which resulted from completion of construction at the Bureau of Reclamation Tiber Dam Project in Liberty County would be offset by initiation of construction at the Noxon Rapids Dam (Sanders County) and at two air bases, as well as by expansion of

Mineral Production in Montana, 1955-1956[1]

Mineral	1955		1956	
	Short Tons (unless otherwise stated)	Value	Short Tons (unless otherwise stated)	Value
Chromite concentrate, gross weight	118,703	$ 3,718,882	118,780	$ 3,806,926
Coal: Bituminous	1,216,893	3,665,915	[2](845,708	[2](3,468,000
Lignite	30,360	115,964	(	(
Copper (recoverable content of ores, etc.)	81,542	60,830,332	96,426	81,962,100
Fluorspar	25,223	[3]	59,775	[3]
Gold (recoverable content of ores, etc.), fine ounces	28,123	984,305	38,121	1,334,235
Iron ore (usable), long tons, gross weight	6,631	[3]	13,040	[3]
Lead (recoverable content of ores, etc.)	17,028	5,074,344	18,642	5,853,588
Manganese ore and concentrate (5 to 35 percent Mn 4) gross weight,	106,026	[3]	80,553	[3]
Manganiferous ore and concentrate (5 to 35 percent Mn) [4] gross weight	6,341	[3]	4,752	[3]
Natural gas, million cubic feet	28,255	1,893,100	[2]29,144	[2]1,952,648
Petroleum (crude), 42-gallon barrels	15,654,000	35,380,000	[2]21,759,561	[2]53,226,246
Phosphate rock, long tons	[3]	[3]	557,479	3,956,673
Sand and gravel	13,771,609	6,615,326	10,024,370	7,173,810
Silver (recoverable content of ores, etc.), fine ounces	6,080,390	5,503,060	7,385,908	6,684,620
Stone	1,273,600	1,199,619	1,247,385	1,815,648
Tungsten (recoverable content of ores, etc.) 60 percent WO_3 basis	1,211	[3]	1,230	[3]
Zinc (recoverable content of ores, etc.)	68,588	16,872,648	70,520	19,322,480
Value of items that cannot be disclosed: Barite, cement, gem stones, gypsum, lime, natural-gas liquids, phosphate rock, pumice and pumicite pyrites, sulphur (1956), talc, vermiculite, and values indicated by footnote [3]		25,637,201		21,296,277
TOTAL		[5]$167,162,000		[5]$210,947,000

[1]Production as measured by mine shipments, sales or marketable production (including consumption by producers). Some minerals that originated in Montana cannot be credited owing to lack of information.
[2]Preliminary figures.
[3]Figure withheld to avoid disclosure of individual company confidential data.
[4]Production figures on manganiferous ores (less than 35 percent Mn) mined and shipped to government stockpile depots not included in state totals.
[5]Total has been adjusted to eliminate duplication in the value of stone.

State Highway Department activities. These projects did not develop as rapidly as anticipated. Use of sand for construction and as road material increased 108 percent and 120 percent, respectively, over 1955. Gravel for construction purposes declined 89 percent compared with advances of 11 percent and 53 percent for road material and railroad ballast during the same period.

A minor decrease in the output of stone (2 percent) during 1956 was accompanied by a 51 percent advance in value brought about by a generally higher reported figure for the various rock products. Firms in 15 of the state's 56 counties contributed to the total yield of 1,200,000 tons, valued at $1.8 million. New construction begun at the Washington Water Power Co. Noxon Rapids Dam and at air bases at Glasgow and Great Falls helped to offset the effect of completion of the Tiber Dam project upon consumption of crushed stone.

Mining operations were active in the following categories, arranged in order of tonnage produced: limestone (14), sandstone (7), granite (8), and basalt (3). Output of limestone again increased, continuing the upward trend begun in 1953.

Hawaii

The Territory's mineral production in 1956 reached an all-time high, increasing more than 90 percent over the previous year. Stone has been the major mineral commodity produced in the Islands, and it was this material that accounted for the

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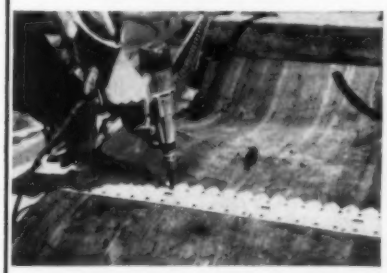

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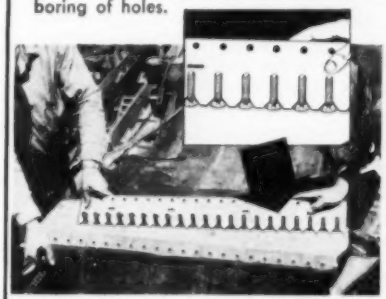

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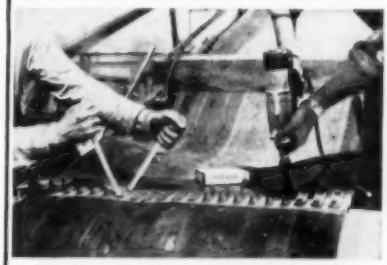

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greater value during the year. A large tonnage of stone was produced by a dredging company for the Department of the Navy and stockpiled for eventual use as aggregate and rough fill.

Most of the stone output was utilized in constructing and maintaining the Territory's roads. Approximately equal quantities of basalt and coral were mined for road materials, a lesser tonnage of limestone being used for concrete and road metal. Some of the limestone mined on Oahu was kilned at Honolulu, yielding a noteworthy tonnage of lime. Carbon dioxide was a byproduct of the lime operation.

The output of structural sand and paving sand and gravel on the Islands of Hawaii and Oahu showed an appreciable increase over 1956. The tonnage of miscellaneous clays mined and utilized for heavy clay products declined appreciably. There was a moderate production of salt from seawater by solar evaporation which was consumed largely in the processing of certain foods. Volcanic cinders and ash were quarried on Hawaii and used for road building and maintenance at various sugar plantations.

Employment in the mineral industry was higher than in 1955. The increase, which was most noticeable during the second quarter of 1956, was credited to the stone industry. New labor contracts, completed during the latter part of 1955, gave mineral industry employees a higher average weekly wage.

Alaska

Receipts of minerals at mints and smelters and estimates of production from individuals and companies indicated the total value of 1956 mineral production from Alaska was $750,000 less than the value in 1955, according to the Bureau of Mines, U. S. Department of the Interior. A drop in the value of gold production largely accounted for the decrease in total value.

Sand and gravel replaced gold as the leading commodity produced by the Alaskan mineral industry, in terms of value. Gold was second in value, and coal ranked third. Mercury production increased sharply, climbing to fifth place in 1956. Chromite production showed a slight rise above 1955.

Merger Plans for Bestwall, Johns-Manville Called Off

Johns-Manville Corporation, New York, N. Y., and Bestwall Gypsum Company, Ardmore, Pa., decided against a proposed merger by mutual agreement.

Company officials issued jointly the following statement: "As a result of preliminary investigations made by both companies, the conclusion was reached that a merger at this time was not feasible."

Mineral Production in Alaska, 1955-1956[1]

Mineral	1955		1956 (estimated)	
	Short Tons (unless otherwise stated)	Value	Short Tons (unless otherwise stated)	Value
Antimony ore	—	—	2	2
Chromite, gross weight	7,082	$ 625,340	7,200	$ 704,000
Clays	1,112	3,836	—	—
Coal, bituminous	[3]639,696	[3]5,759,000	675,000	2
Copper (recoverable content of ores, etc.)	1	746	—	—
Gold (recoverable content of ores, etc.), troy ounces	249,294	8,725,290	204,300	7,150,500
Lead (recoverable content of ores, etc.)	1	298	—	—
Mercury, 76-pound flasks	2	2	3,414	837,140
Sand and gravel	9,793,214	8,242,344	9,100,000	8,300,000
Silver (recoverable content of ores, etc.), troy ounces	33,693	30,494	26,700	24,165
Stone	265,740	289,589	50,000	22,000
Tin (content of concentrates), long tons	86	182,484	—	—
Undistributed: gem stones, platinum-group metals, antimony, coal, and those minerals whose values must be concealed for particular years (indicated by footnote reference 2)	—	1,552,427	—	7,621,500
TOTAL	—	$25,412,000		$24,659,000

[1]Production as measured by mine shipments or marketable production (including consumption by producers) except that fuels and mercury are strictly production.
[2]Value included with "Undistributed."
[3]Preliminary figure.

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There is a marked trend toward reclaiming worked-out pits—and a parallel trend toward the use of Allis-Chalmers crawler tractors and scrapers. Both are examples of wise management.

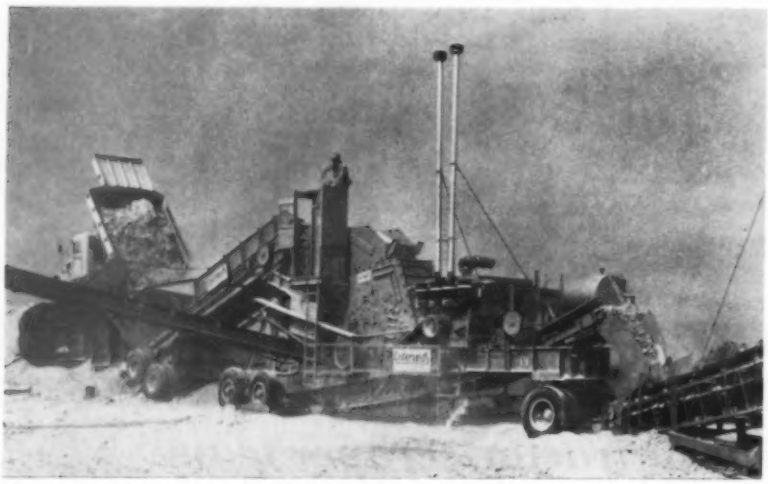
Land Reclamation—already a law in many states—eliminates to a large extent the scarred and worthless landscapes left by abandoned pits and piles of overburden. Properly reclaimed land usually returns far more than the cost of reclamation in higher resale value. Even where pits can be only partially filled, the land may be seeded profitably for pasture.

Allis-Chalmers HD-21 Crawler Tractor and 315 Scraper are ideal for this type of operation. This team is mobile and flexible enough to strip overburden and spread it immediately in a worked-out area of the pit. This eliminates the need of re-handling overburden and of calling in specialized equipment.

Curved and offset cutting edge on the scraper, plus torque converter drive on the tractor, are just two of many features that put this Allis-Chalmers team in a class by itself for this type of work. Let your Allis Chalmers construction machinery dealer give you the details. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

• This action shot at the open-pit mine operated by the Pacific Coast Borax Company Division, United States Borax & Chemical Corporation near Boron, Calif., shows a Kenworth Model 802 rock and ore mover ready to go to the crusher with a capacity load of sodium borate ore. Another unit, immediately behind the first, is being loaded. Pacific Coast Borax operates a fleet of the 24-ton, 300-hp. turbocharged Kenworths, which make an upgrade haul of 7,000 ft. from pit to crusher.



• At the crusher operation of H. L. Stafford near Lubbock, Tex., the maximum 12-hr. output from a Cedarapids 3645 portable Double Impeller impact primary is estimated to be 6,564 cu. yd. This unit is equipped with a 42-in. by 30-ft. ground level feeder, a master Tandem plant, a 40-in. by 6-ft. double-deck vibrating grizzly, and a 23-yd. Jack Bin unit. Finished size screen is 2 in. S.C.O. No fines are removed. The material, caliche, requires about 70 percent crushing. This plant is fed by a 2½-cu. yd. Northwest 8 OD shovel and four 10-ton Euclid rear-dumps.

W. G. Woolf was named to succeed Le Roy E. Traeger, general superintendent of the Conda (Idaho) Phosphate Mine, as president of the Idaho Mining Association.

Permanente Cement Company, in its semi-annual statement to shareowners, reported record high sales of $26,368,000 for the first six months of this year, compared with $21,287,000 for the corresponding period in 1956. Consolidated net earnings for the six months ended July 31, 1957, totaled $2,826,000, equivalent to 50 cents per share. This compares with $3,226,000 or 57 cents in 1956.

The Lone Star Cement Corporation recently moved its division offices to 120 Sixth Avenue North, Seattle, Wash.

Officers and Directors Elected by Canada's Ocean Cement & Supplies

Ocean Cement and Supplies Ltd., Canada, parent company of the recently amalgamated British Columbia Cement Company, Ltd., Victoria, B. C., and Evans, Coleman and Gilley Brothers, Ltd., North Vancouver, B. C., has elected members to serve on its board of directors.

Heading the new concern as president is Gordon Farrell, Vancouver, who is also president of both component operating companies.

Vice-presidents named are William F. Foster, Vancouver, and J. D. Milne, London, England. Mr. Foster is executive vice-president of Evans, Coleman and Gilley Brothers and its subsidiary companies. Mr. Milne is an executive of Associated Portland Cement Manufacturers, Ltd., of England. They are also major shareholders and technical advisers of Ocean Cement.

Directors are the Rt. Hon. C. D. Howe, P.C., former minister of Trade and Commerce; Colonel The Hon. Clarence Wallace, C.B.E., president of the Burrard Drydock Company, Ltd.; H. S. Foley, chairman of the board of the Powell River Company, Ltd.; and Robert Ian Ross of Victoria, who represents the family shareholders of the B. C. Cement Company.

Peck-Woolf Sand & Material To Build Plant in Kansas

Peck-Woolf Sand and Material Company, with sand and dredging facilities in Muncie, Kans., and material yards and offices in Kansas City, Kans., was granted a $30,000 permit for a new plant in Wyandotte County, Kan.

The permit was for preparatory grading and initial construction of sand dredging apparatus. The yard office and equipment are expected to be completed within two years. Approximately 10 men will be employed.

William F. Anderson, president of the firm, indicated that operations at Muncie will continue as long as practicable.

Compañia de Cemento del Sur del Perú has begun building a cement plant in Juliaca in southern Peru. Early in 1957 arrangements were completed with the Markus group of London, Britain, to finance the plant at $4,300,000. Production is expected to begin in the latter half of 1958 with an initial capacity of 1,000 barrels a day, which may be doubled later.

Blasting Techniques

(*From page* 115)

Loading and Hauling Two 80D Northwest 2½ cu. yd. shovels normally handle loading out operations, with a third on hand as a spare. Nine end-dump 16T Euclids haul from pit to plant.

Water Problem With the water table virtually at ground level, water has been a problem ever since the first shot. On March 1, after being closed for the winter, the pit—then 50 ft. deep—was full of water covered with 2 ft. of ice, and overflowing. Four pumps, each rated at 4,000-gal. per minute capacity with a 105 ft. head, spent the month of March working around the clock to dry the hole. Two of the same pumps, working less frantically now, keep the pit dry during operation.

Each shot drilled to a point below water level is dug first to the water. Then the pumps lower the water level and digging commences again. This process is repeated until the shot is loaded out.

The primary problem created by the water is the result of pressure rather than the wetness itself. Loading the last few holes of a shot against the resistance of water pressure built up by plugging the other holes with explosives has been nearly impossible on several occasions. The problem was solved by using smaller diameter (5 in. instead of 5½-in.) cartridges in the 6-in. holes thus allowing the water to escape around the explosive column.

Crushing Plant The quarry is producing aggregate destined primarily to the construction sites of the Dwight D. Eisenhower Lock and the Grasse River Lock. These two locks will provide the necessary 90 ft. lift in the Long Sault Canal through which the Seaway channel by-passes the St. Lawrence Power Project dams and the International Rapids section of the river opposite Massena. Aggregate output is divided roughly as follows: 25 percent 6-in. stone and 25 percent sand, with the remaining 50 percent consisting of 3, 1½, and ¾ in. stone.

The primary plant consists of one 42- by 48-in. and one 30- by 42-in. Telsmith overhead jaw crushers and a Telsmith 16B. Making up the secondary plant are seven Nordberg 4 ft. short-head Symons cone crushers and one standard 4½ ft. Symons cone crusher. The surge pile is generally made up of 6 in. stone, although at times 3 in. stone is used.

Power Generation An interesting sidelight in the operation of the quarry is the plant power station. Because of the suddenly abnormal construction activity in the area, commercial power could not be guaranteed available at the site in time for operations. Therefore, a generating station was set up at the quarry.

Electric power is provided by five diesel motor-generator sets. Each of three huge 750-hp. Winton diesels drives a 485-kw. Electrical Machinery Corp. generator rated at 152 amps and 2300 volts. The other two sets are 500-hp. Caterpillar diesels driving 280-kw. General Electric generators rated at 94.8 amps and 2400 volts. Cost of power generated in this manner is about the same as purchased power when the cost of special lines and transformers for the latter is taken into account.

John C. MacDonald, resident manager of U. S. Lime Products Corporation at Sloan, Nev., announces the promotion of W. E. Ellis to general superintendent; George F. Rodrigues to acting superintendent, and C. L. Conner to administrative assistant to the resident manager.

Chicago Gravel Co.

(*From page* 112)

1-cu. yd. railroad-type clamshell units.

With a crew of 30 men headed by H. M. Anderson, superintendent, the plant produces five basic products in round and crushed gravel and sand. Advantageously located in relation to several rail carriers, the plant can originate shipments on the C. M. St. P. & P., E. J. & E., C. A. & E. and the I. C. railroads. Local truck shipments are weighed out over 30-ton Columbia and 50-ton Howe truck scales. The latter, fitted with a 50-ft. platform, was recently installed to conform with a new state law requiring weighing the full length of a semi-trailer at one pass.

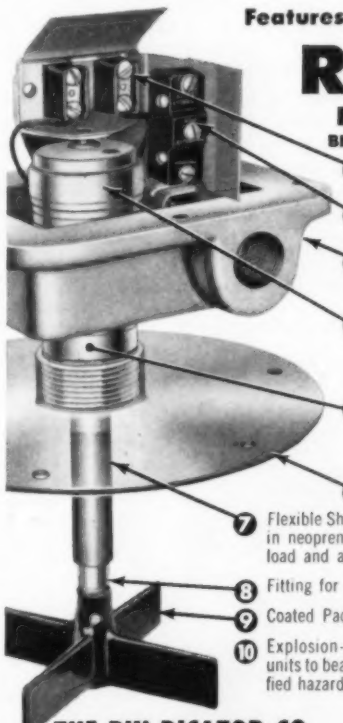
In addition to the long established Elgin operation, Chicago Gravel has plants at Plainfield and Joliet, Ill. Combined, these three provide around 2,000,000 tons of material annually for consumption in Chicago and metropolitan areas. Officials of the organization include G. W. Renwick, president; F. E. Renwick, vice-president and treasurer; L. A. Behrle, secretary-general traffic manager; J. A. Hart, assistant secretary-treasurer; C. H. Wicks, general superintendent; and D. E. Hammond, assistant general superintendent.

Features of the Improved

ROTO-

BIN-DICATOR

BIN LEVEL INDICATOR



1. H.D. Terminal Block; easy connections.
2. Micro Switch for control circuit.
3. Dust-tight gray iron housing; std. or exp. proof.
4. Low Torque Motor supported on 2 bearing points for protection from vibration.
5. Precision Ground Drive Shaft; packed ball bearings for H.D. operation.
6. Mounting Plate 8" dia.
7. Flexible Shaft; heavy coil spring molded in neoprene for long life under heavy load and abrasion.
8. Fitting for easy shaft extension.
9. Coated Paddle resists abrasion.
10. Explosion-Proof Models; first and only units to bear U.L. Label for use in specified hazardous atmospheres.

THE BIN-DICATOR CO.
13946-T Kercheval • Detroit 15, Mich.

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WE SELL DIRECT • PHONE ORDERS COLLECT

Take Care Of That Cable!

Cable is an expendable item which must be replaced frequently during the life of a machine. Considerable savings can be realized by giving cable proper care and maintenance.

By J. B. SINCLAIR
Service Department
Caterpillar Tractor Co.

WHAT happens inside a cable as it bends when passing over a sheave and then straightens out while moving to the next sheave? The individual wires are preformed in what might be thought of as a long spiral and twisted together into strands. These strands are twisted together into a rope. This construction permits great flexibility without excessive "stretchiness" and minimizes friction between wires as the cable bends and straightens. In operation a cable is a group of closely fitted moving parts.

Handling Suggestions Cable, like any other part of a machine, requires reasonable care. Its service life can be shortened by abuse or lengthened by proper use and maintenance. Here are some suggestions on proper handling of cable.

1. Do not roll a reel of cable over an obstacle with the cable taking the brunt of the shock, or use a pry bar to move a reel of cable. Some of the life is taken out of the cable before it is put to use if it is thus abused.

2. Do not permit sharp bends or kinks to form in a cable. These are very frequently the cause of rapid wear. When a cable is bent or kinked, the wires and strands are moved out of their relative positions, and unequal tensions are created on individual wires. Kinks are caused by careless handling of the cable, either on or off the machine.

3. In unreeling or uncoiling cable from a reel, pull the cable straight away from a rotating reel. Do not let the reel rotate faster than the cable is being removed as the danger of kinking is increased considerably. When cable is removed from a reel which does not rotate, uncoil the length of cable required, placing one coil on top of the other. The cable can then be easily moved to the job site and installed without kinking.

4. Always be sure to use correct cable size.

5. Weld or otherwise bind the end of the strands of cable together. If this is done, the strands are held in their relative positions, and cable wear will not be excessive because of loose, high strands which move out of position.

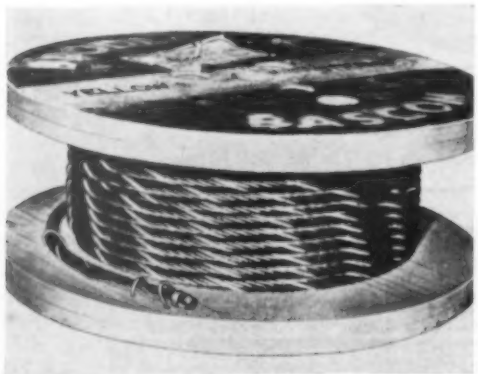
6. Secure strands of the cutoff end of the reel and the end of the cable to the reel.

7. Do not drive nails through the cable to secure it to the reel, as wires can be damaged or broken and the cable weakened.

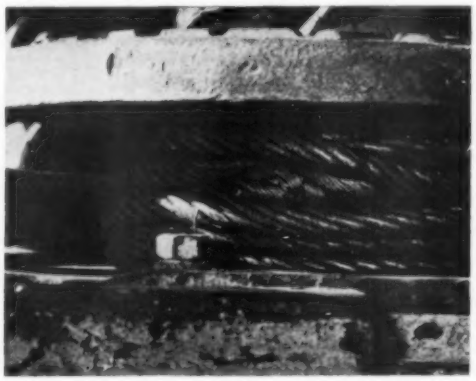
8. In installing new cable, assemble the cable on the drum in the direction of the natural coils. If installed correctly, the cable will have a greater tendency to reel onto the drum in a smooth layer.

Lubrication and cleaning Proper lubrication of cables will extend cable life, promote safety, and reduce downtime. The frequency of cable lubrication depends largely upon operating conditions. If dusty conditions prevail, the cable should be lubricated sparingly, if at all, since dust will adhere to the

(*Continued on page* 146)



Left: Welding the end of the cable, as shown in this illustration, prevents fraying. Note the method of securing the loose end to the reel.



Right: Careless handling of cable causes kinking. Worn cable such as this means that it must be replaced prematurely; it also presents a safety hazard.

Here's NEW mobile efficiency for YOU!

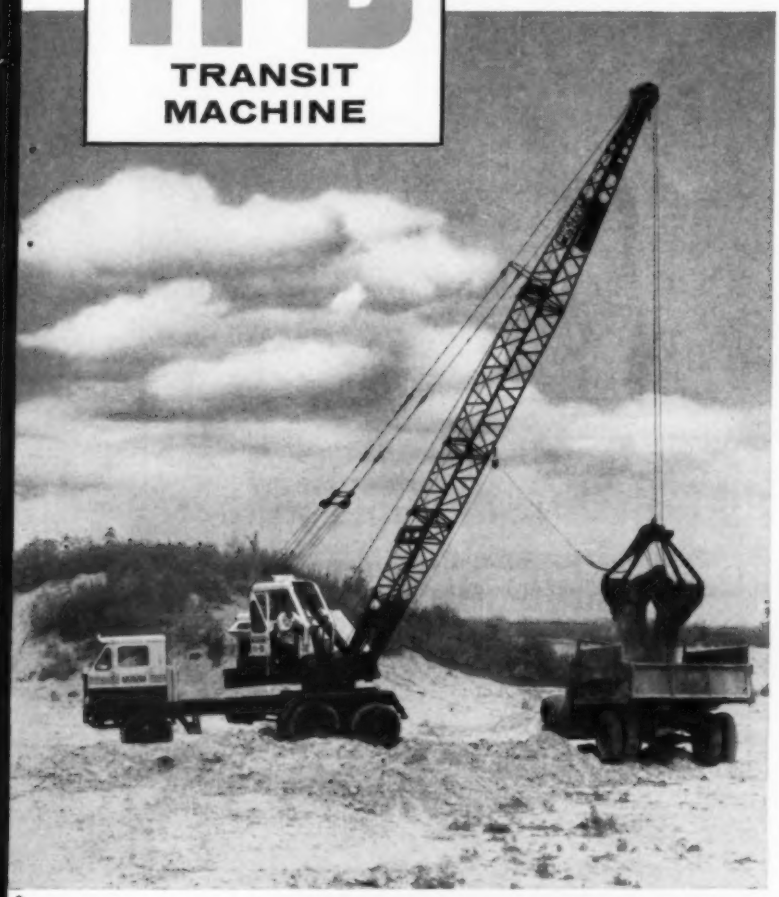
BUCYRUS-ERIE

11-B

TRANSIT MACHINE

CLAMSHELL
DRAGLINE
SHOVEL
HOE
CRANE

3/8-yd. excavator
10-ton lifting crane



From pit to crusher plant . . .

The NEW Bucyrus-Erie 11-B Transit Machine is ready to keep your sand and gravel operations at peak efficiency.

You'll profit from the 11-B's simple, compact design; from its versatility and economical operation. You'll find the 11-B provides the speed and mobility to handle scattered pit operations profitably. What's more, the 11-B gives you time-saving accessibility for low cost maintenance.

The two-section cab provides ample room for the operator and features sliding, hinged, and removable panels that open to power plant and main machinery. Unit or bench assemblies in main machinery permit quick service and easy replacement, minimizing downtime.

Fill in the coupon below and drop it in the mail TODAY. Give us an opportunity to explain ALL the advantages of the 11-B's simple, easy-does-it design. You can enjoy *unmatched quality at low cost* with this fast-moving, hard-working, easy-to-maintain mobile crane-excavator.

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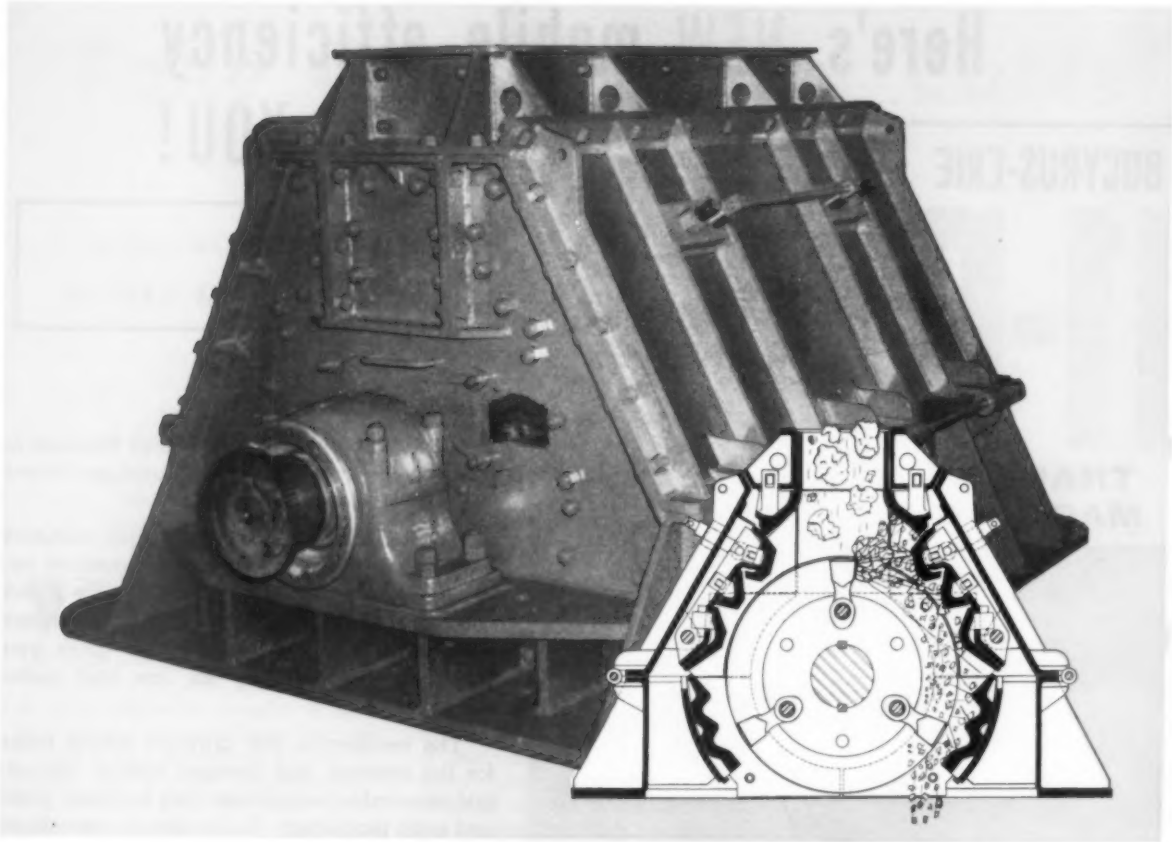

The most popular crusher in the cement industry for secondary reduction

Cement companies in the United States and Canada have forty-seven 15-50 and 17-50 Pennsylvania Reversible Impactors in service. One company has five in as many plants. These figures do not include additional units on order that are being manufactured, nor does it include the smaller sizes in use in cement plants.

This preference (more than twice as many as all other makes combined) is significant because cement plant operators have very exacting manufacturing requirements. They investigate thoroughly new procedures, developments and methods. Word gets around fast and if any new design is offered it is immediately evaluated with Pennsylvania. Only by superior performance and lower operating costs has Pennsylvania been able to maintain this leadership since 1937, the year Pennsylvania invented and patented the Reversible Impactor.

To get complete information about Pennsylvania Reversible Impactors, with patented adjustable breaker blocks, ask for Bulletin #6017. The great developments in crusher design are still coming from Pennsylvania.

PENNSYLVANIA

REVERSIBLE IMPACTORS

PENNSYLVANIA CRUSHER DIVISION

Bath Iron Works Corporation • West Chester, Penna.

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

SOIL SAMPLING EQUIPMENT BULLETIN # 300 illustrates and describes in detail the soil samplers and accessories manufactured by *Sprague & Henwood Inc.* The bulletin introduces several new soil testing devices, such as the S & H Vane Shear Tester. (1)

POWER TRANSMISSION BELTING made of polymer and chrome tanned leather is featured in a catalog issued by *Extremultus, Inc.* The catalog contains sections on significant applications, a description of the belt, and selection of the proper belt type. (2)

PHOTO-FORMING OF METAL PARTS for a variety of industrial and commercial products is illustrated and described in Bulletin 90 published by *Superior Tube Company.* Included is a description of mechanical screens for separating, washing, dewatering, and filtering sand and for dewatering slurry in cement plants. (3)

CENTRALIZED LUBRICATING SYSTEMS in the cement industry are discussed in an illustrated booklet just produced by the *Trabon Engineering Corporation.* Included are diagrams, sketches, and application stories, as well as a complete description of Trabon's "Multizone" system for lubricating hundreds of bearings from one central station. (4)

REFRACTORY PRODUCTS manufactured by the *A. P. Green Fire Brick Company* are detailed in an illustrated catalog which also contains estimating data for refractory materials, and a description of refractories made by its subsidiary, Richard C. Remmey Sons Co. (5)

DAVEY COMPRESSOR COMPANY has issued a new bulletin descriptive of its Model 125 rotary compressor. Unit illustrations, complete specifications, and a rotary compression cycle diagram are bulletin features. (6)

STATIONARY AIR COMPRESSORS are described in literature published by the *LeRoi Division, Westinghouse Air Brake Company.* The Westinghouse unit type and LeRoi stationary air compressors illustrated in the literature range in size from ½ to 100 hp. (7)

ROLL LOT V-BELTING literature offered by *The Boston Woven Hose & Rubber Company* explains the uses and features of Boston Bull Dog roll lot V-belting. Detailed specifications and data include "Equivalent Length Tables" for endless V-belting replacements. (8)

AN EARTHMOVING CATALOG covering I-H mobile construction equipment is available from the *International Harvester Company.* On-the-job photos show crawler tractors, Payscraper units, International Drott Skid-Shovels and 4-in-1 units, and Payhauler units. (9)

A NEW VIBRATING SCREEN brochure issued by the Stephens-Adamson Mfg. Co. includes comprehensive technical information and illustrations on Style No. 300 Normal-Duty and Style No. 44 Heavy-Duty Series of vibrating screens, their applications, specification data, and a detailed theory of screening practice. (10)

WARNER ELECTRIC BRAKE & CLUTCH COMPANY offers a complete, fully illustrated story of Warner's newest electric brake designed for fail-safe applications. This 36-page report includes photographs, drawings, diagrams, and a complete explanation of operations and selection factors. (11)

A POWER-ANGLING DOZER BLADE for 80 and 100 hp. Case TerraTrac crawler-tractors is featured in J. I. Case Company's bulletin CTS-106. Features, including the "counter-rotating" Terramatic transmission are described, and specifications are given. (12)

A NEW LIQUID CYCLONES BROCHURE published by *Equipment Engineers Inc.* features installation photos and performance data on many widely diversified applications of the Krebs cyclones. (13)

MACHINES AND PROCESSES used in the production of V-belts are described in a booklet released by the *Goodyear Tire & Rubber Company.* Rubber compounding, preparation of fabric, building steps, curing and finishing are subjects for 1-page descriptions of V-belt manufacturing operations. (14)

A ROCK DRILL BIT GRINDING WHEEL brochure available from *The Bay State Abrasive Products Company* deals with problems encountered in percussion and rotary rock drill bit grinding. When to grind, how to grind, and how to select grinding wheels for grinding rock drill bits is discussed. General recommended specifications for machine grinding rock drill bits are included. (15)

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Pit and Quarry Publications

431 South Dearborn Street

CHICAGO 5, ILL., U.S.A.

NOVEMBER, 1957

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Address_____

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More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

A DUST COLLECTION SYSTEM, said to be 98.5 percent efficient, is described in a technical article reprint offered by the *Buell Engineering Company.* The overall installation is illustrated. Text describes how each unit operates and how the system ties in with the production process. **(16)**

A VARIABLE SPEED V-BELT CATALOG and reference handbook has been made available by *The Dayton Rubber Company.* The catalog gives complete cross-reference information on every variable speed V-belt for every type or make of unit, and also contains complete interchange listings. **(17)**

DEVELOPMENT AND USE OF CORE BARRELS in Diamond Drilling is the title of an 8-page booklet published by *E. J. Longyear Company.* Included is information on 7 types, from simple single tube barrels to double tube, swivel type barrels. **(18)**

RUST PREVENTION SYSTEMS are outlined in a 4-page brochure released by *L. Sonneborn Sons, Inc.* It tells where, when, and how to use S.R.P. 75 Primer for priming rusted surfaces; and S.R.P. 87 Finish Coat. Test results are included. **(19)**

GEARED FLEXIBLE COUPLINGS manufactured by the *Link Belt Company* are detailed in a publication, Book 2775, which contains application and selection data for couplings with maximum bores ranging up to 7 in. and ratings from 2½-to 572-hp. per 100 r.p.m. **(20)**

MODEL 104 TROJAN TRACTOR SHOVEL is the topic of a brochure prepared by *The Yale & Towne Manufacturing Company.* The illustrated brochure describes the features on the 1¼ cu. yd. Model 104, gives complete specifications, and includes a list of standard and optional equipment. **(21)**

NOVEMBER, 1957

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THE AIRCO ELECTRODE GUIDE, available from *Air Reduction Sales Company,* contains helpful features, including an electrode consumption calculator which provides data for calculating consumption per linear foot in the welding of various types of joints. **(22)**

SHOVELS, DRAGLINES, AND CRANES in the Model 3000 Series manufactured by the *Manitowoc Engineering Corporation* are described in a 16-page booklet. In addition to full specifications, the bulletin outlines in detail engineering features of the Model 3000. **(23)**

NEW BOTTOM DUMP BOOKLET published by the *Athey Products Corporation* features the Athey PW20 bottom dump trailer. It illustrates PW20 design and application features. **(24)**

CATERPILLAR TRACTOR COMPANY has issued a booklet dealing with the forthcoming heavy demand on the aggregate producing companies because of the Federal Aid Highway Program and the part Cat-built equipment can play in helping meet the demand. **(25)**

HOW TO GET BETTER WELDS is a new, completely revised edition of the Weldors' Vest Pocket Guide published by the *Hobart Brothers Company.* The guide includes information on metals and electrodes and essentials of proper welding procedures. **(26)**

HOLDBACK BULLETIN 557, published by the *Stephens-Adamson Mfg. Company,* features comprehensive technical data, specifications, and illustrations on the S-A Standard Roller Type Holdback, S-A Totally Enclosed Type Holdback, and the S-A Automatic Ratchet and Pawl. **(27)**

MAINTENANCE OF CRAWLER TRACTOR PARTS is discussed in a new brochure, Rexarc From No. 757, available from *The Sight Feed Generator Company.* The different stages and conditions of wear patterns of tractor parts are illustrated together with a composite of the tractor parts that can be rebuilt by the Rexarc system. **(28)**

INDUSTRIAL OVERLAY METALS INC. offers literature describing four new Bergstrom alloy products—Dimaloy abrasion strips, Mangaloy multi-service castings, Mangaloy applicator bars, and Mangaloy tooth repointing bars. **(29)**

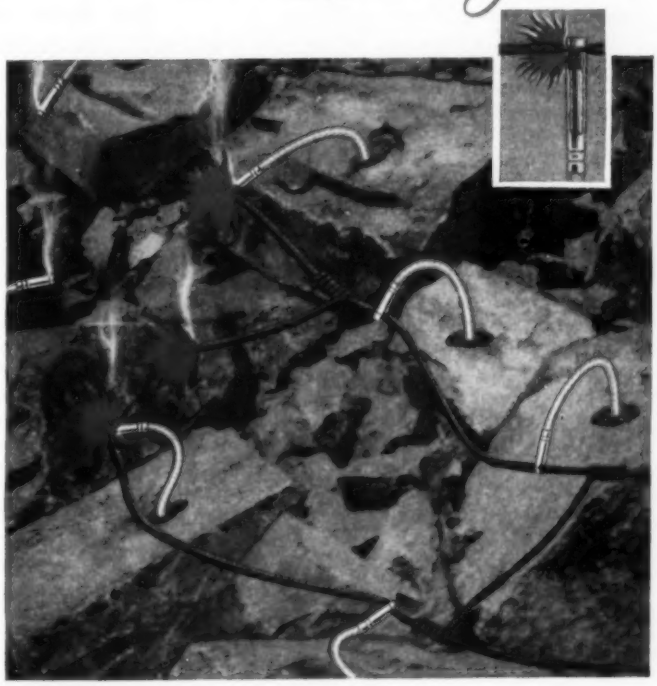
CAST STEEL SPROCKETS manufactured by the *Farrell-Cheek Steel Company* are described in Catalog No. 21 which contains specifications and features. **(30)**

BELT SAVER PULLEYS are covered in a catalog published by *Van Gorp Mfg., Inc.* Specifications, pulley dimensions, and keyseats for self-cleaning taper-lock pulleys are included, in addition to a description of the features. **(31)**

GRAPHILM INDUSTRIAL LUBRICANT NO. 702, a new gear lubricant developed by *Charles Pettinos, Inc.,* contains a specially developed additive which enables it to adhere to the metal, and prevents dripping off. More information is available. **(32)**

It's nice work . . . if you can get him!

But in secondary blasting, one-shot lighting is better . . . *with* Quarrycord



You'll find it less hazardous. The men are off the rock pile while each fuse is being lighted.

You'll find it easier. You can cut all fuse to the minimum length prescribed by your State law and prepare your fuse primers with caps and connectors, ready to load *any* hole.

You'll find it more convenient, because with Quarrycord you can fire your holes whenever you're ready, without fear of stray electrical currents from electrical equipment or thunderstorms causing a premature blast.

You'll get a series of small blasts – "pop-pop-pop!" – instead of one big blast – "boom!"

Quarrycord looks like colored twine. It burns with an intensely hot open flame which travels at the rate of about one foot per second.

Quarrycord Connector is a short copper tube with a burning element and a slot in the business end. You crimp it onto the end of the safety fuse and place the Quarrycord into this slot, pressing the flap down to hold it securely.

Quarrycord hook-up connects all holes in the blast with trunk lines and connecting branch lines designed to get the fire to each fuse before the first hole goes. The free end is led off to a point from which escape is easy. You light this end with a match and go to a place of safety.

This folder contains the information you need to start enjoying greater safety and better blasting with Quarrycord. Write for your free copy today.

Your explosives supplier can furnish Quarrycord and Connectors.

Q-3

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Pressure Hydration of Dolomitic Lime

By T. L. WEBB
National Building Research Institute
and
V. SAMPSON
Cape Lime Company

PART II

Pilot Pressure Hydration Plant

The pilot plant designed is illustrated diagramatically in Figure 6. The approximate volume of the cylindrical pressure vessel, which was about 2.5 ft. in diameter and 9 feet long, was 44 cu. ft. It was subjected to a hydraulic pressure test of 400 p.s.i. before use. In operation, a weighed quantity of dolomitic quicklime was placed in the pressure vessel through the charging port and the agitator was run for a short while to distribute the charge fairly uniformly.

With the discharge cock and both discharge and charging ports closed and the agitator running, a measured amount of water was pumped into the pressure vessel *via* the meter (M), and water feed line. Some initial investigations indicated that the minimum effective operational pressures measured on the duplicate gauges P.1 and P.2 of the order of 70 p.s.i. as suggested by the work described, were easily obtained, and a number of trial batches were prepared using quicklimes ranging from soft-burnt to hard-burnt. Temperature and pressure and water additions were recorded at intervals of one minute. The test results are graphically presented in Figures 7 and 8.

Soft Burnt Lime

In Figure 7 the conditions prevailing in the pressure hydrator for a very soft burnt lime are presented.

From these data it is apparent that the pressure and the temperature rose to about 52 p.s.i. and 320 deg. F. respectively in about seven minutes, a period corresponding to the addition of about 250 lb. of water to about 1,200 lb. of quicklime, after which they dropped fairly sharply until about 12 minutes after the commencement of the test, and then remained fairly steady until the completion of the test at 25 minutes. Eleven minutes after the commencement of the test, Sample 3 was taken by briefly opening the discharge cock. Sample 4 was taken at the completion of the run. Soundness tests by modified Le Chatelier** and autoclave test methods gave the results presented in Table 2.

FIGURE 6

DIAGRAMMATIC ILLUSTRATION OF PILOT PLANT PRESSURE HYDRATOR

Table 2

	Modified Le Chatelier Test (Soundness factor)	Autoclave Expansion (%)
Sample 3	10.3	2.1
Sample 4	0	0.1

Soundness of Pressure Hydrates

Differential thermal analysis studies indicated that some hydration of both the magnesium and calcium oxides took place during the last 14 minutes of pressure hydration. The plasticity of the pressure hydrate (Sample 4) was very low (below 100 Emley units). After ball milling for 20 minutes the plasticity increased to about 600 Emley units, well above the American specification,[19 20] minimum limit of 200. The final product was entirely sound and, after ball milling, highly plastic.

**In Le Chatelier unsoundness test the lime is mixed with sufficient water to give a standard Vicat penetration of 10 mm. ± 3 mm. using a 300 gram needle of 1 cm. diameter. This material is then placed in a standard Le Chatelier mould and a 100-gram weight is placed on the upper metal cover of the mould. The distance in mm. between the pointers is measured (d_1) and the moulds stored for 24 hours in an environment of 95 percent relative humidity and 70 deg. F. The moulds with the 100-gram weights in position are placed in a steaming chamber out of contact with liquid water. The water in the chamber is boiling when the samples are inserted. After steaming for 3 hours the distance between the pointers is again measured (d_2), and after a total steaming period of 8 hours finally measured (d_3).

The values given are calculated as follows:

3 hr. expansion = $d_2 - d_1$ mm.
8 hr. expansion = $d_3 - d_1$ mm.
S.F. (Soundness factor) = $(d_3-d_1) + 3(d_2-d_3)$.

Hard-burnt Lime

In Figure 8 analogous data in respect to a severely overburnt lime are presented. Both pressure and temperature rose more rapidly to values of about 200 gallons of water to 1,400 lb. of quicklime. Thereafter, both temperature and pressure dropped gradually until 20 minutes after the commencement of the test. The introduction of water was stopped at this stage (670 lb.). Thereafter both temperature and pressure increased gradually until the test ended (45 min.).

Samples were taken at the times indicated in Figure 8 and were investigated from the point of view of extent of hydration by differential thermal analyses and loss of ignition data, and their soundness was evaluated by Le Chatelier and autoclave tests. The results are presented in Table 3. The autoclave tests yielded such high expansions that the specimens disintegrated with the exception of that of Sample 11, which gave a value of about 20 percent, still a very unsound material.

EFFECT OF TIME OF PRESSURE HYDRATION ON EXTENT OF HYDRATION AND SOUNDNESS OF OVERBURNT DOLOMITIC QUICKLIME

These data indicate the progressive hydration of both calcium and magnesium oxides and the reduction in unsoundness which take place during pressure hydration. Further evidence that the last magnesium oxide to hydrate has a highly unsound nature is found in the fact that while there is little difference in the amount hydrating after about 30 minutes, as shown by the magnesium hydroxide peak areas and the loss on ignition, there is a marked reduction in unsoundness (from S.F. 34 to 24).

A further very interesting conclusion from the d.t.a. evidence is that in pressure hydration calcium oxide does not necessarily hydrate completely before magnesium oxide commences to do so, but rather that they hydrate concurrently, the calcium oxide hydrating much more rapidly. This finding has a bearing on the validity of the assumptions used in calculating the unhydrated oxide content of dolomitic limes, namely that in apportioning water of hydration, the demands of the calcium oxide in respect to water of hydration should be satisfied before any water is attributed to the magnesium oxide.[19]

The plasticity of Sample 11 as obtained was poor (below 100 Emley units), but ball milling for 20 minutes increased this to 450, a value well above the minimum for plastic limes.

In order to assess the effectiveness on an overburnt lime of the pressure hydration process, in comparison to the normal mechanical hydration process, a batch of the overburnt quicklime used was hydrated in the latter plant. Its properties are compared with those of the pressure process product in Table 4.

Table 3

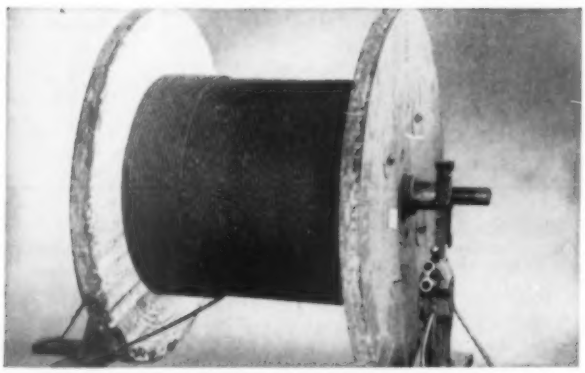
Sample No.	Time after Commencement of Test (Minutes)	Corrected Area under Peak of Thermogram (Sq. cm.) $Mg(OH)_2$	Corrected Area under Peak of Thermogram (Sq. cm.) $Ca(OH)_2$	Loss on Ignition (Percent)	Modified Le Chatelier Test (Soundness factor)
5	0	0.0	5.9	8.0	—
6	5	1.6	11.0	18.5	94
7	18	7.8	16.4	27.8	56
8	31	10.9	17.1	30.0	34
9	39	11.5	16.6	29.1	38
10	45	11.6	15.8	30.7	27
11	50	11.7	15.7	30.8	24

Table 4

Hydration process	Loss on Ignition (percent)	Soundness Factor	Emley Plasticity (30 Minutes after Wetting) Unmilled	(20 minutes) Ballmilled
Pressure Hydration	30.8	24	100	450
Mechanical Hydration	16.9	86	121	285

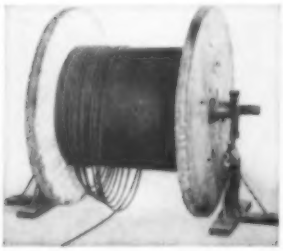
FIGURE 7
CONDITIONS IN PILOT PLANT PRESSURE HYDRATOR (SOFT BURNT LIME).

Tuffy Wire Rope Tips



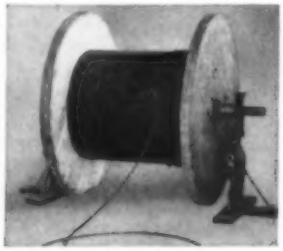
Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



This reel is set up right

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



This reel is set up wrong

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.

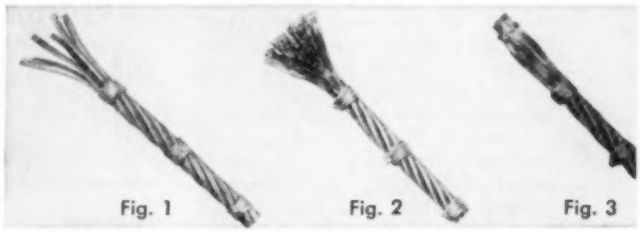
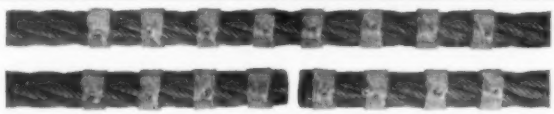


Fig. 1 Fig. 2 Fig. 3

Eight steps of correct SOCKETING

1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.
2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.
3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha or gasoline. Then dip the wires in commercial muriatic acid, to a depth not greater than ¾ of the cleaned length of wire. Keep them immersed for 30 seconds to 1 minute, or until the acid has thoroughly cleaned each wire. Be sure acid does not contact any other portion of the rope.



Follow these steps for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

When cutting ordinary ropes, thoroughly seize (bind, serve or tie) so there will be no misplacement or relative movement of strands. For most ropes, other than preformed, *three* seizings should be used on each side of the cut. *Four* seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a wire strand core. *Four* seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.

Tuffy Special Wire Ropes are tailored to special use. Ordering is easy:

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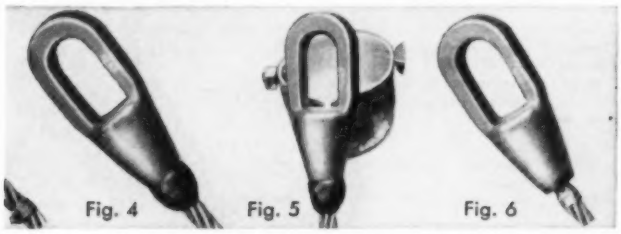
Constructed to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves, hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Watch your steps

when you unwind, seize, clip, socket and reeve wire rope



4. Dip the wires in boiling water containing a small amount of soda, to neutralize the acid.

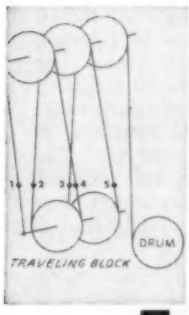
5. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

6. Insert the rope end into bottom of socket. Remove temporary tie wire.

7. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

8. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

REEVING



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

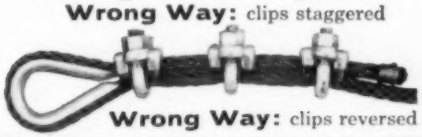
Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

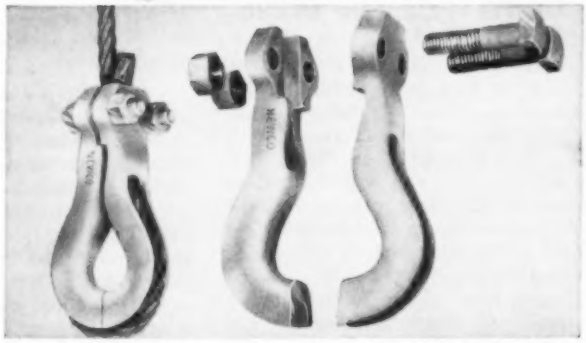
Attaching by CLIPPING

RIGHT WAY for greatest rope strength

Wrong Way: clips staggered



Wrong Way: clips reversed



The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope.

Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

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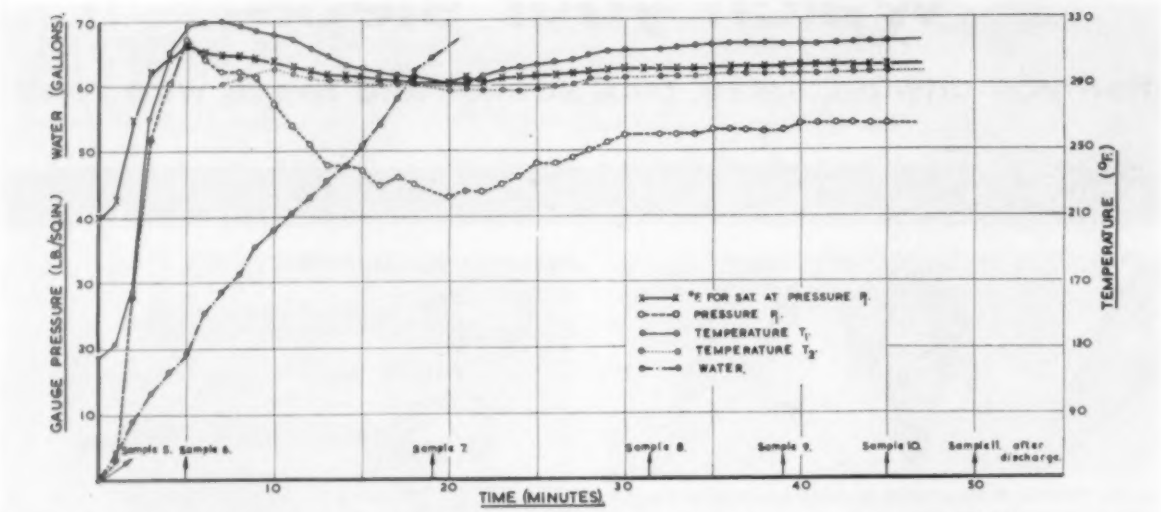


FIGURE 8. CONDITIONS IN PILOT PLANT PRESSURE HYDRATOR (HARD BURNT LIME).

COMPARISON OF PROPERTIES OF PRESSURE AND ORTHODOX HYDRATE

From these data it is apparent that while a severely overburnt dolomitic lime cannot, by subjection to a pressure hydration process involving 50 hour/pressure units, be rendered sufficiently sound for it to meet an autoclave expansion limit of 1 percent, it can nevertheless yield a product which is sufficiently sound for use in mortars and sanded plasters, and (if ball milled) highly plastic. Orthodox mechanical hydration yields a highly unsound product having (when ball milled) a lower although acceptable plasticity.

These results, together with analogous data for quicklimes intermediate between the two extreme samples described, indicated that this process was capable of yielding completely sound hydrates, which, when ball-milled, possessed high plasticity. Accordingly, it was decided to construct a full scale pressure hydration plant.

Full-Scale Pressure Hydration Plant

The work already described indicated that for an operational cycle of reasonable time, high pressures would be necessary. Since continuous type pressure hydrators such as that described by Warner[14] clearly precluded high pressures, the principle of using a batch unit was adopted. The use of higher pressures than those used in the pilot plant appeared justified and accordingly the pressure vessel was designed to operate at pressures up to 200 lb. per square inch so as to permit the attainment, if necessary, of 200 hour/pressure units in a reasonable period.

Description of Plant and Operation

A simplified flow sheet of the plant is presented in Figure 9 and the plant itself is illustrated in Figure 10. In the illustration the cylindrical pressure vessel, surmounted by the batch storage hopper, is in the central foreground.

In operation, batches of approximately 6 tons of quicklime are weighed into the batch storage hopper and discharged by gravity into the pressure vessel through a 12-in. diameter charging valve, which is then closed. About 400 gallons of water are pumped into the vessel with the ribbon-type agitator running at about 5 r.p.m. At this stage the blow-off valve is closed. Pressure builds up rapidly until, after 5 to 10 minutes, depending on the activity of the lime, a pressure of about 150 p.s.i. is reached. At this stage the temperature is 340 deg. F. The temperature of saturated steam at this pressure is 365 deg. F., indicating that conditions of superheat are not even approached.

At this point an automatic blow-off valve operates and prevents the pressure from rising above this value. The pressure gradually drops and after a suitable period, which depends on the reactivity of the lime, generally between 20 and 40 minutes, the steam pressure is reduced by a blow-off valve, the main discharge valve in the base of the pressure vessel is opened, and the contents are discharged in the form of an apparently dry powder into an underground collection pit. A screw conveyor transfers the hydrate from the collection pit to a drier, where the heat in the lime is sufficient to evaporate any excess water; and subsequently a bucket elevator conveys the lime to a storage silo, after which it is ball-milled, air-separated, and bagged.

The pressure vessel, 7 ft. in diameter and 20 ft. long, has dished ends and is constructed by rivetting from 1¼-in. thick steel plate. The agitator requires about 80 hp., and its main shaft passes through stuffing boxes to outrider bearings, as can be seen in Figure 10. The charging, discharging, and blow-off valves, and all elevators and conveyors are operated by remote control from a control room.

Instrumentation includes semi-automatic indicating, recording, and control devices in respect to the lime-weighing device, batch storage hopper pressure, and temperature of the pressure vessel, water feed installation and level; and operational indications in respect to storage hoppers and conveyors. Additional orthodox safety valves are provided in the event of failure of the servo-operated blow-off valve. Further safety appliances in the form of electrical blocking devices preventing operator errors such as opening main valves under high pressure, are incorporated. A further ultimate safeguard is provided in the form of a water flooding system to chill the whole pressure vessel in the unlikely event of complete failure of the other protective devices.

Performance of Plant

Over a period of some six months this pressure hydrator, which, so far as is known, is the first full-scale plant*** in operation outside the Americas, has operated satisfactorily on rather variable dolomitic quicklime and has a capacity of about 15 tons of hydrate per hour. A typical pressure hydrate has the characteristics shown in Table 5.

Table 5

Chemical Composition		
H_2O	(Free)	0.5
H_2O	(Combined)	25.5
CO_2		2.4
R_2O_3		1.5
SiO_2		6.8
CaO		37.6
MgO		26.9
Physical Properties		
Fineness (% by weight retained on screen indicated)		
30	BSS	0.0
200	BSS	15.0
Soundness		
Soundness factor		2.0
Popping test (BSS)[21]		Sound
Autoclave expansion		5%
Emley plasticity (30 min. after wetting)		
Before ball-milling		180
After 30 min. ball-milling		350
Water retention (A.S.T.M method)		90%

CHEMICAL AND PHYSICAL PROPERTIES OF TYPICAL PRESSURE HYDRATE

From these data and a field assessment of the performance of the pressure hydrate produced, it is concluded that this process, using the plant described, is capable of the consistent and economic production of a hydrated dolomitic lime satisfactory for use in mortars and sanded plasters from rather variable but generally somewhat overburnt quicklime, which cannot be satisfactorily hydrated using orthodox methods. Used on a soft-burnt quicklime, this process yields hydrates having soundness factors of zero and autoclave expansions well below 1 percent, materials satisfactory for use in putty plasters. The work described in this paper is indicative of the nature and scope of the research necessary to permit the design of a pressure plant; but it must be stressed that the data obtained do not necessarily apply to other dolomitic limes.

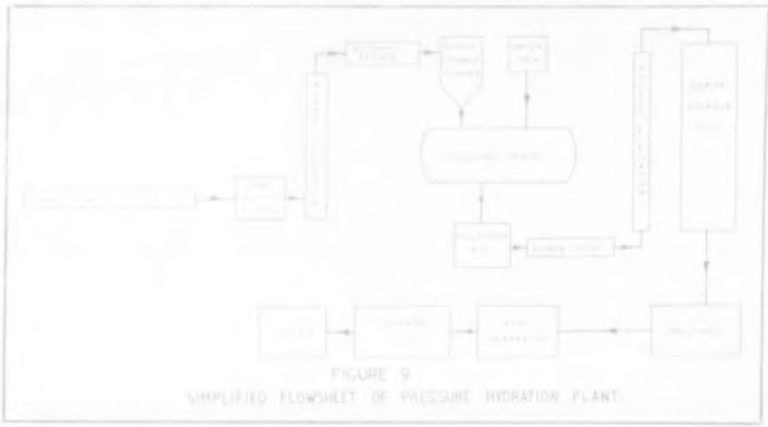
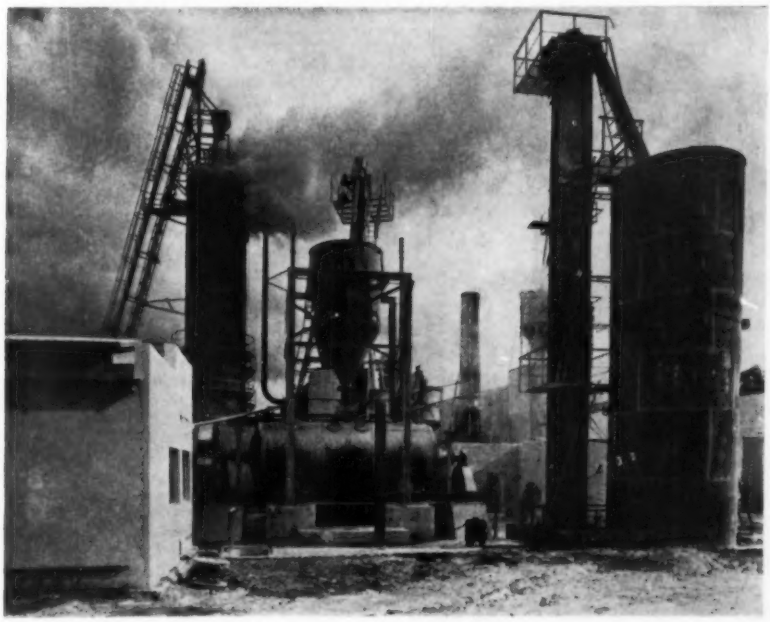


FIGURE 9
SIMPLIFIED FLOWSHEET OF PRESSURE HYDRATION PLANT

***Small batch pressure hydrators have been used in England and Germany for the production of small amounts of high-calcium lime for sand lime brick manufacture.

Fig. 10—A general view of a pressure hydration plant.



Acknowledgments

This paper is presented by permission of the S. A. Council for Scientific and Industrial Research and the Board of Directors of Cape Lime Co. Ltd.

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(*Continued on page* 142)

Oliver C. Ralston Retires From Bureau of Mines Post

Oliver C. Ralston, chief metallurgist of the Bureau of Mines, United States Department of Interior, Washington, D. C., since 1949, retired recently from this position.

Mr. Ralston joined the bureau in 1927 at Pittsburgh, Pa. He was largely responsible for developing the bureau's metallurgical program from a single station at Salt Lake City, Utah, to its present international position. In 1953 he was awarded the Distinguished Service Award and Gold Medal, the department's highest honor.

Mr. Ralston plans to engage in consulting work and has already agreed to such a task for a private industry.

Tillotson Refractories Sold To Pacific Clay Products

Assets of Tillotson Refractories Company, Corona, Calif., have been acquired by Pacific Clay Products, Los Angeles, for an undisclosed price.

With the addition of the Tillotson facilities, which are said to have annual sales of $1,500,000, Pacific Clay's sales are expected to be boosted to more than $10,000,000 annually.

Pacific Clay Products, headed by John D. Fredericks, president and general manager, produces glass sand, refractories, and clay products at its four plants—all located in California.

Natl. Safety Council Names Hoefer, Kuhli to Staff

The National Safety Council has announced the appointment of two staff executives for programs—H. J. Hoeffer, Denver, Colo., and Ralph Kuhli, Wheaton, Ill. Mr. Kuhli formerly was assistant director of the Council's home safety division. Both men will work with the assistant general manager for programs in developing programs and services of various departments, and in evaluating the effectiveness of the plans.

Mr. Hoeffer recently retired with the rank of brigadier general after 30 years of service with the U. S. Army in the United States and abroad.

Standard Paving and Materials, Ltd., has acquired all the capital stock of Guelph Sand and Gravel, Ltd., Guelph, Ont., Canada, and Curran and Briggs Ready-Mix, Ltd.

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Pressure Hydration

(*From page* 141)

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▲ PRIMARY CRUSHING—**Two Telsmith Roller Bearing Jaw Crushers** with **two Telsmith Heavy Duty Apron Feeders**—a 42 x 48 crusher with a 48" wide feeder; and a 30 x 42 crusher with a 42" wide feeder.

Three Telsmith 5' x 12' Double Deck Vibro-King Sizing Screens ▼

• In Helena, New York, near Massena, this Lambert-Mills-Gorman plant is supplying aggregate for the Robinson Bay and Grass River Locks. Plant produces about 8,000 to 10,000 tons per day, of four sizes: minus 6" plus 3", minus 3" plus 1½", minus 1½" plus ¾", minus ¾" plus 4 mesh and manufactured sand. Primary crushing is efficiently handled by Telsmith 42 x 48 and 30 x 42 Jaw Crushers. Their product is scalped—plus 6" going to a 16-B Telsmith Gyratory Crusher; and minus 3" to a surge pile, then to three Telsmith double deck Vibro-King Screens.

Send for Equipment Bulletin 266

Q-35

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

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KOEHRING WORK CAPACITY *in action...*

21.5 mph Cruiser® — One man controls all operations, one engine supplies all power for work and travel on Koehring 205 Cruiser crane. There's a full range of low working speeds up to 7 mph — plus travel speeds up to 21.5 mph. It has smooth torque-converter drive, power steering, 27½-foot turn radius, 30% gradability. Usefulness is unlimited in mines, pits, and quarries. 205 Cruiser lifts up to 15 tons — handles ½ to ¾-yard clamshell or dragline buckets on a wide work radius — converts to ½-yard shovel or hoe.

Swings a big bucket — Notice the size of this dragline, stripping a coal seam in an Eastern mine (below). It's the big Koehring 1205 — and handles 3 to 4-yard bucket, depending on weight of materials. Boom lengths: 60 to 170 feet. This big-capacity stripper also converts to 3-yard shovel. High-lift model has a 3-yard dipper on 40-foot shovel boom — or a 2½-yard dipper on 50-foot shovel boom.

Ship to shore — A pair of Koehring 405 clamshell cranes, mounted on a Great Lakes dredge — one of the world's largest — solved the problem of transferring sand from the ship's hold to shore. With this system, approximately 4,500 tons of sand are unloaded in 6 hours. Crane in foreground dumps into a Johnson Lo-Bin, mounted on flanged wheels. Lo-Bin travels along track, transports sand to a swinging, boom-type conveyor, which stockpiles it at dockside. On clamshell work, Koehring 405 handles 1 to 1½-yd. buckets. Check its other capacities in chart on opposite page.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	30,000 lbs. 14,600 lbs.	at 12-ft. radius at 20-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-ft. radius at 30-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs. 40,000 lbs.	at 15 ft. radius at 25-ft. radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

Want more information? See Koehring distributor.

E760

In heavy rock — Owner of this Southern mine needed a heavy-duty shovel to strip rocky overburden — picked a Koehring ¾-yard 305 for the job. Its powerful digging crowd, and rugged strength of deep-section boom and dual dipper sticks, proved more than a match for the heavy rock. Yet, in work like this, 90% power-assist on main drum clutches gives operator a light lever-pull and sensitive "feel" of load. Power, strength, stability as a shovel increase the 305's work capacity with all attachments. For proof, check its lift ratings (at left).

Take Care of That Cable!

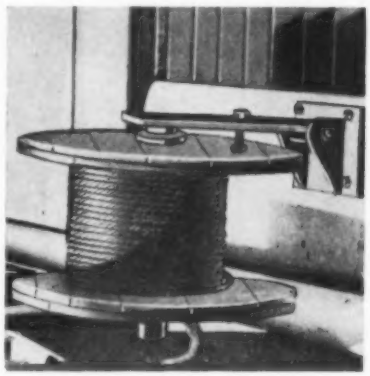
(*From page* 130)

cable and sheaves. Cable lubrication is recommended in areas where atmospheric conditions support rusting and corrosion. A film of lubricant will definitely extend cable life.

To prevent rusting, cable lubricants should be water-resistant; they should contain no acids or alkalies; and should have a high surface tension. Each time a cable is flexed, the wires in each strand and the strands which make up the cable must slide over each other. For this reason, a penetrating, clinging lubricant of high melting point such as "crater compounds"—used for open gears and cables on shovels or cranes—should be used. In the event of an extended or seasonal shutdown, the cable should be cleaned and well lubricated. Sheaves and rollers should always be kept clean and well lubricated to facilitate free turning, to minimize sliding wear.

Operation and Maintenance Properly maintained equipment means extended life for all parts concerned. Inspections to determine operating conditions and the replacement of worn or broken parts is economy and not a waste of time or money.

The operation and maintenance of cable controlled equipment determines, to a large extent, the life of a cable. Misaligned sheaves, bad sheave grooves and frozen (non rotating) sheaves can reduce cable life by causing burning and eventual fraying. Whenever there is excessive friction between the cable and the other parts of a machine, burning usually resluts. Burned cable soon cracks and becomes brittle. Cracked wires lead to frayed strands and a weak spot in the cable.



A small spare reel of cable, mounted as shown, makes the replacement of worn or broken cable an easy task.

The useful life of cable can also be reduced if it operates over sheaves that "shimmy" because of worn sheave bearings. The result is rope vibration, which causes steel fatigue.

After installing a new cable, treat it as you would a piece of equipment. Don't overstress it. Break it in easy, so that the individual wires and strands have an opportunity to stretch and position themselves in the sheaves and around the drum. Do not jerk out slack, as this can break even a new cable. Avoid sudden starts or stops. "Bird caging" of the cable can result from sudden stops. The sudden reduction of tension weakens cable considerably.

Reducing Wear In almost every application in which cable is used there are points at which wear is more rapid. It is therefore economical to reverse the cable, end for end, when wear becomes apparent.

Some owners have equipped their dozers with a small spare drum or reel of cable, so that only the length of cable needed can be quickly fed through the "dead end" to replace the length of cable cut off or broken. When cable wear occurs on the drum end, the "dead end" wedge is removed and new cable is pulled through the system far enough to eliminate the worn section. The worn cable, anchored to the cable control drum, is cut off as necessary and the "dead end" wedge reinstalled.

Another helpful practice is to cut off a foot (or 2 ft.) of cable periodically, so that "fresh" cable moves to critical wear points, such as the spots at which bends occur, and over sheaves.

A similar method of obtaining maximum cable life can be used on scrapers. The reels, mounted on the scrapers, carry extra cable which can be pulled through the system for a sufficient distance to provide an unworn section of cable over sheaves. The worn cable on the cable control drum can then be cut off as necessary.

Archer-Daniels-Midland of Minneapolis, Minn., has taken over the Wyodak Chemical plant in South Dakota and is planning to build a bentonite plant, the fourth of its kind, in Belle Fourche, S. D.

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STEEL DROP BALL

✓ SPECIALLY DESIGNED
✓ GREATER IMPACT
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Budget-minded quarrymen specify the "Cape Ann" Drop Ball to insure record rock-breaking efficiency. Equipped with a forged connecting link, protected by a deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

Write today for full details

Cape Ann Anchor & Forge Co.

Gloucester • Massachusetts

Stripping 20 feet of overburden at a phosphate mine near Mt. Pleasant, Tenn. This TD-24 rolls full blades of topsoil and clay 150 feet — in only 40 seconds. The blade is an International cable 'dozer. Owner of the outfit: Rochelle and Collison, Mt. Pleasant, Tenn.

PLANET POWER STEERING...THE BIG DIFFERENCE...

MAKES THE

TD-24...the rig for stripping

...reports Rochelle & Collison, Mt. Pleasant, Tenn.

Mining contractors, Rochelle and Collison, have compared costs, work-production and profits, and have the answer: the Planet Power steered International TD-24 is tops for tough overburden stripping!

"The TD-24 is the machine for stripping," declares George E. Collison, Jr., for the contracting firm. "Being able to steer under load without stopping one track makes the big difference.

"Planet Power steering plus the fast reverse keeps the TD-24 producing while other machines are loafing.

"For side-cutting (or benching), the TD-24 has no competition. Its rear end doesn't scoot away from the bank—not with the inside track in high range, and the outside in low!"

"Dead-track drag" eliminated

Any king-sized steering-clutch crawler can only give you one-track power on the turns. TD-24 Planet Power steering eliminates power-wasting "dead-track drag." TD-24 full time two-track power means full-load push or pull on the turns, as well as straightaways!

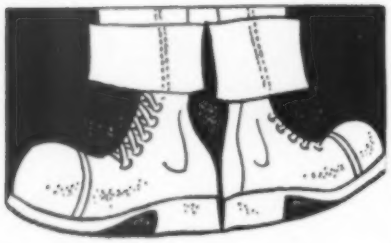
Exclusive TD-24 Hi-Lo shifting permits instant gear-changing on the go—without stopping or even declutching. Fingertip matching of speed to load under full power speeds production!

Find out how these and all the other TD-24 production exclusives can make the big difference in your profit-making capacity. See your International Construction Equipment Distributor for a TD-24 demonstration!

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.



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are fine . . .
BUT!

Safety shoes can save your feet, but they can be tough on weigh-batch hoppers . . . or any other type of bin or chute. The firm vibrating action of a Cleveland Vibrator is the modern, efficient way of stopping bridging or arching before it starts, and keeping granular material moving.

Cleveland pneumatic and electric vibrators have been designed for use on weigh-batch hoppers. Both these models include standard brackets and clamps for fast easy installation.

Pneumatic

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Bridging of sand, gravel, cement, or even wet concrete; in the weigh-batch hopper is broken up quickly and quietly with a Cleveland Vibrator.

There is no better way to handle bulk material handling problems than with a modern Cleveland Vibrator.

Write for further details and prices.

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Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

An interesting legal question was asked recently by the owner of a sand and gravel plant. "If a company has a contract with the state to remove sand and gravel from a river, can such company prevent competitors from taking materials from the river?"

Last month a higher court broadly answered this legal question in the affirmative.

For illustration, in *Dreyer v. American Sand and Material Company*, 308 Pac. (2d) 127, the higher court held that gravel, rock, and sand in navigable rivers is the property of the state, and authority for its removal from such rivers is governed by laws of the state. In other words, this recent higher court held that a company which had contracted with the state for removal of sand from a river could prevent a competitor from removing sand from the river at a point directly across from company's location. The court said:

"Defendants (competitors) were taking sand upstream from the line described in the order of the director of purchases, within a distance of 1,500 ft. above plaintiff's (American Sand and Material Company's) plant."

This court explained that if public officials are authorized by a state law to lease property, or sell sand and gravel from the beds of navigable waters, the contract is valid and enforceable and the court will prevent others from infringing on the contract.

Assignment Is Valid

A reader asked this question: "Does the employer own all patents obtained by his employee? If not, can the employer make a valid and enforceable contract with an employee to this effect?"

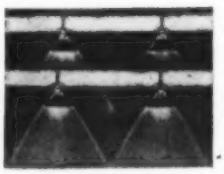
Modern higher courts consistently hold that an employer owns all patents which an employee invents on the employer's time. However, the employer has no legal right, interest, or ownership in a patent which an employee invents on his own time, as at his home or whenever he is not being paid for his time by the employer.

In other words, an employer ordinarily has no rights or interest in inventions or patents of his employees. However, a late higher court held a contract valid and enforceable by the terms of which an employee agreed to transfer to his employer all rights and interest to all inventions which he invented while in his employ.

For illustration, in *United Products, Inc., v. Cruzan*, 62 N. E. (2d) 763, the testimony showed that a manufacturer made a contract with an employee by which the latter agreed to transfer to the manufacturer inventions "now known to the party of the first part (employee), or discovered or made by the party of the first part, either in whole or in part, during the term of said employment."

The higher court upheld the validity of the contract and compelled the

CONCENCO® Spray Nozzles

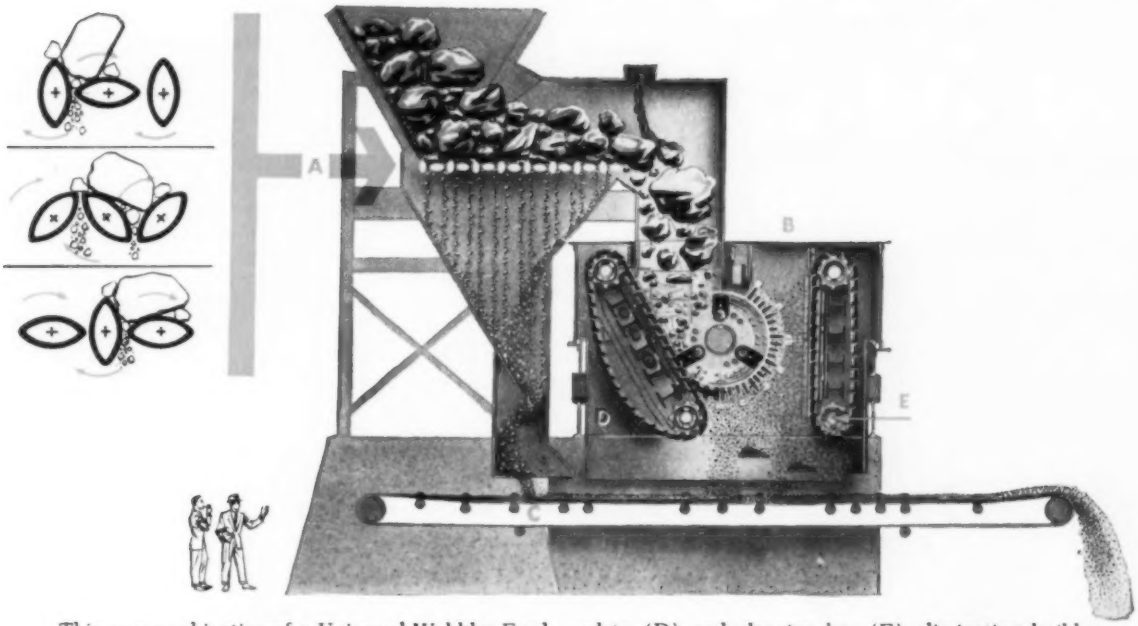


These handy spray nozzles are simple, inexpensive and easy to install. . . All you do is drill one oversize hole for each nozzle, clamp on, adjust and get results. They may be definitely aligned for sheet flow or staggered according to need. Are removed or replaced in a moment's time. Machined orifices assure uniform, accurate performance. Send for full information.

THE DEISTER CONCENTRATOR CO. 911 Glasgow Ave., Fort Wayne, Ind.

new feeder-hammermill combination

makes possible 50 to 100% capacity increases



This new combination of a Universal Wobbler Feeder (patented) and a Bulldog Hammermill was engineered for one of the world's largest cement mills to average 600 tons per hour. Here's how it works . . . here's why it can boost capacity for you.

The Universal Wobbler Feeder (A) feeds the Bulldog Hammermill (B). Elliptical-shaped Wobbler bars are set in alternate vertical and horizontal positions to form the feeder bed. Turning of the bars imparts a rocking, tumbling motion to the load. Mud and clay are worked loose, fines sift through bars and drop to under-conveyor (C) oversize is delivered to the Hammermill. Wobbler operates on 15 to 25 h.p.

Bulldog Hammermills feature a traveling breaker plate (D) and cleaning bar (E) eliminating build up of material in breaking chamber. Regardless of moisture, a Bulldog Hammermill keeps your crushing operation going without clogging or jamming in wet, sticky material.

This is why you can increase your production up to 100%. The Wobbler Feeder sends only oversize to the Bulldog Hammermill. Thus, the Bulldog can handle more loads per day, produce more finished material. And you get double non-clog protection by the scalping effect of the Wobbler Feeder and the non-clog moving breaker plate on the Bulldog Hammermill.

Let our engineers show you how this combination can work for you. Write to

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AUXILIARY EQUIPMENT:
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- CONVEYORS
- SCREENS
- BINS

employee to assign his patentable inventions to the manufacturer, although such inventions were perfected by the employee on his own time at his home during evenings.

Jury Trial Not Allowable

Another reader asked this question: "If a corporation condemns quarry property for its public use, can the quarry owner demand a trial by jury to determine the amount the corporation must pay for the condemned or appropriated land?"

A few weeks ago a higher court answered this question in the negative, if the state's laws do not clearly provide for a jury trial.

For illustration, in *Michigan Gas Storage Company v. Gregory*, 67 N. W. (2d) 219, the testimony showed facts, as follows: The Michigan Gas Storage Company sought easement rights by condemnation to lay a gas main across private property owned by one Gregory, who operated a quarry. A public hearing was had before state appointed comissioners, who fixed damages allowable to Gregory. The award was not satisfactory to Gregory, who appealed to the higher court and asked for a jury trial to determine the amount of allowable damages and the value of the appropriated law.

Since the state laws do not provide for a trial by jury as to the value of condemned land, the higher court held that Gregory must accept the amount of damages fixed by the commissioners. The court said:

"Did the circuit court err in denying appellant (Gregory's) request for a jury trial? Proceedings to condemn land are special and summary in character and, while subject to judicial review and supervision for certain purposes, are not judicial proceedings . . . It is the general rule that, unless the statute expressly gives an appeal, there is no appeal."

Must Get Permit

Recently I received an interesting letter from the president of a rock quarry corporation. He said: "Our company wants to start operating a rock crusher. What is the proper legal procedure when a land owner desires to crush rock, or conduct any other business in violation to a city zoning ordinance?"

The answer is: Apply for a permit. If it is refused, file suit and ask the court to invalidate the zoning ordinance.

For instance, in *Metcalf v. Los County*, 142 Pac. (2d) 66, it was disclosed that a company decided to use a rock crusher on its land in municiple area zoned for residential purposes.

The Company officials filed a suit and asked the court to prevent city officials from enforcing the ordinance which prohibits the only use for which the company's lands have any value—excavation, crushing, and sale of rock, sand, and gravel.

The higher court refused to hold in favor of the company, explaining that first the company must apply for a permit to operate its business. Then, if the permit were refused, the company can file a suit and prove that the ordinance is inapplicable, unreasonable, or illegal, and therefore void.

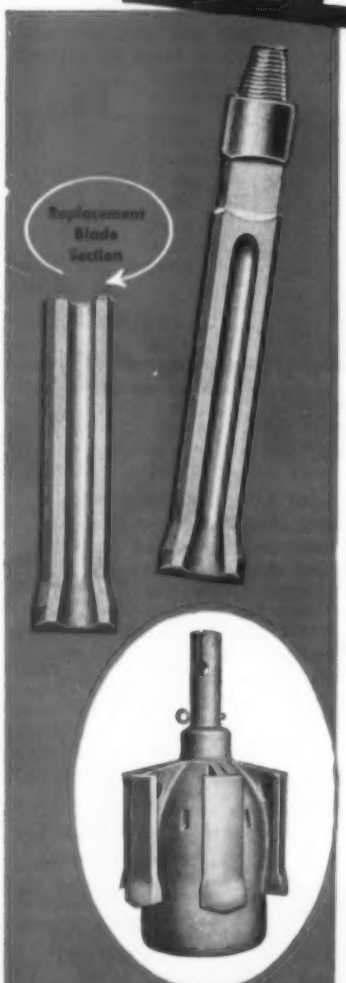
Also, see *Hawley*, 279 P. 136. City officials attempted to prevent a company from excavating rock in a location where a zoning ordinance specifically prohibited the operation of a rock crusher.

The company filed suit and proved that it only excavated rock and did not intend to operate a crusher. The higher court promptly held the ordinance inapplicable, and entered a writ whereby enforcement of the ordinances was enjoined.

New Business Is Excluded

Recently, a higher court held that if a plant has been operated in the

SPANG



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Drill More Holes Per Bit, At Less Cost Per Hole

SPANG CHURN DRILL BITS, famous for long life and economy in the drilling of blast holes for the fragmentation of minerals or overburden, drill *more-holes-per-bit* at *less-cost-per-hole*, because they are fully heat-treated from end to end and have the *extra strength in pin and blade sections* to stand up under the toughest drilling conditions. They are made with semi-dressed ends for quicker, easier finish-dressing, in High Carbon, A.I.S.I. 4340, and Spang Molloy Steel.

Available also, as an added economy, are SPANG REPLACEMENT BLADE SECTIONS in the same grades of steel, and uniform forge section, for welding to pin and collar sections of original bits when long service has worn the integral blade to a point where replacement is desirable.

Anyway you look at it, SPANG BITS are your best buy for more holes at less cost per hole.

SPANG REAMER TYPE PILOT BITS FOR DRILLING LARGE DIAMETER HOLES

Can be supplied in all sizes and in any practical weight.

For information on SPANG BITS, and FREE CATALOG of Complete Line of SPANG Cable System Drilling and Fishing Tools, consult your nearest Dealer, or write direct to:

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For over 60 years Manufacturers of Spang Weldless Jars and a Complete Line of Cable System Drilling and Fishing Tools for Oil and Gas Wells, Water Wells, Prospect Drilling and Shot Blast Holes.

Now . . . a New High in Dust Filter Efficiency . . .

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THESE NEW FIELD-PROVEN FEATURES

- Easier filter bag changing.
- Greater cloth area.
- Fewer operating parts.
- Free-rolling cleaner — no sliding.
- Complete dust seal — automatic seal adjustment.
- Easy access to all dust filter parts for inspection and servicing.

PLUS THESE TIME-TESTED DYNACLONE ADVANTAGES

- Constant suction at dust sources — complete dust collection.
- Self-cleaning for continuous operation.
- No auxiliary motors or blowers required for filter-bag cleaning.
- Greater filtering capacity and smaller space requirements — more cloth per cubic foot of filter than any other make.
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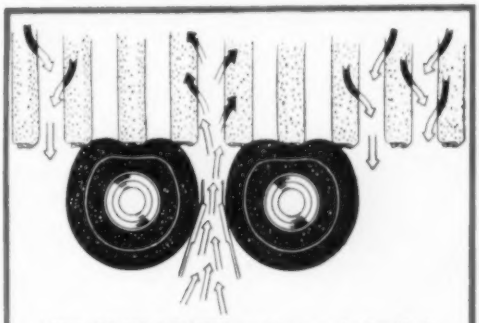
The original self-cleaning dust filter, the Dynaclone has proven itself the most efficient dust filter ever made. The "Roll-Clean" Dynaclone combines design simplicity and rugged construction to insure even greater operating efficiency . . . even longer trouble-free service.



NEW "ROLLER CLEANER" provides greatly simplified method of cleaning dust from filter bags. Resilient rubber rolls automatically adjust to form a positive dust seal as each row of bags is cleaned by atmospheric air.

NEW CATALOG

. . . gives full details on "Roll-Clean" Dynaclone and other Sly Dust Filters . . . contains valuable engineering information. Write for your copy.

See it in Space 73, the Chemical Show, New York Coliseum, Dec. 2-6.

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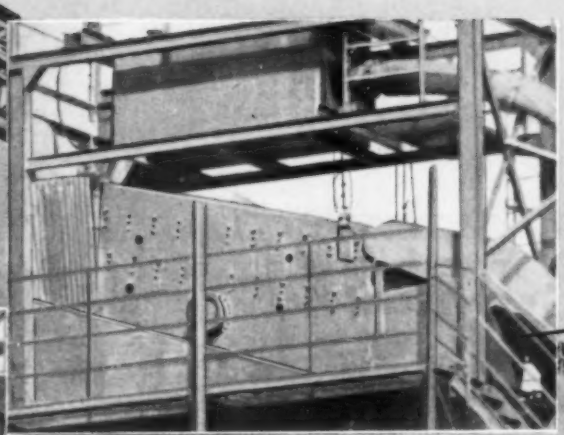
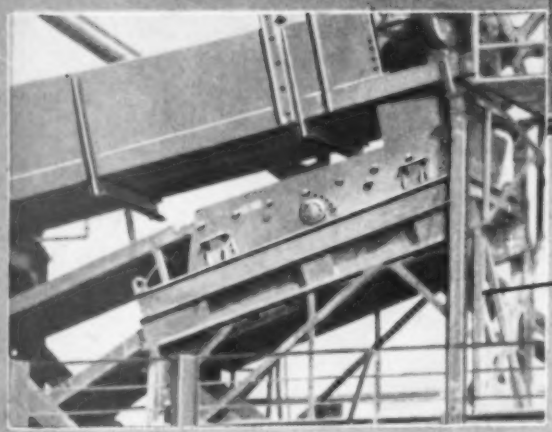
FAST, ACCURATE AND SIMPLICITY AGGREGATE

Material received by the pump box drops to the 4' x 12' Model M-11 Simplifio triple deck screen. The top deck is equipped with 2" square openings. The oversize is chuted into a separate bin. Due to the nature of the deposit there is no need for a crusher, and what oversize accumulates is sold for fill uses. The second deck is equipped with a ⅜" sq. opening. This deposit produces a large amount of pea gravel, and the excess which cannot be combined into concrete aggregates is chuted to another bin. All other materials between the first and third decks is passed onto the logwasher where it is thoroughly cleaned.





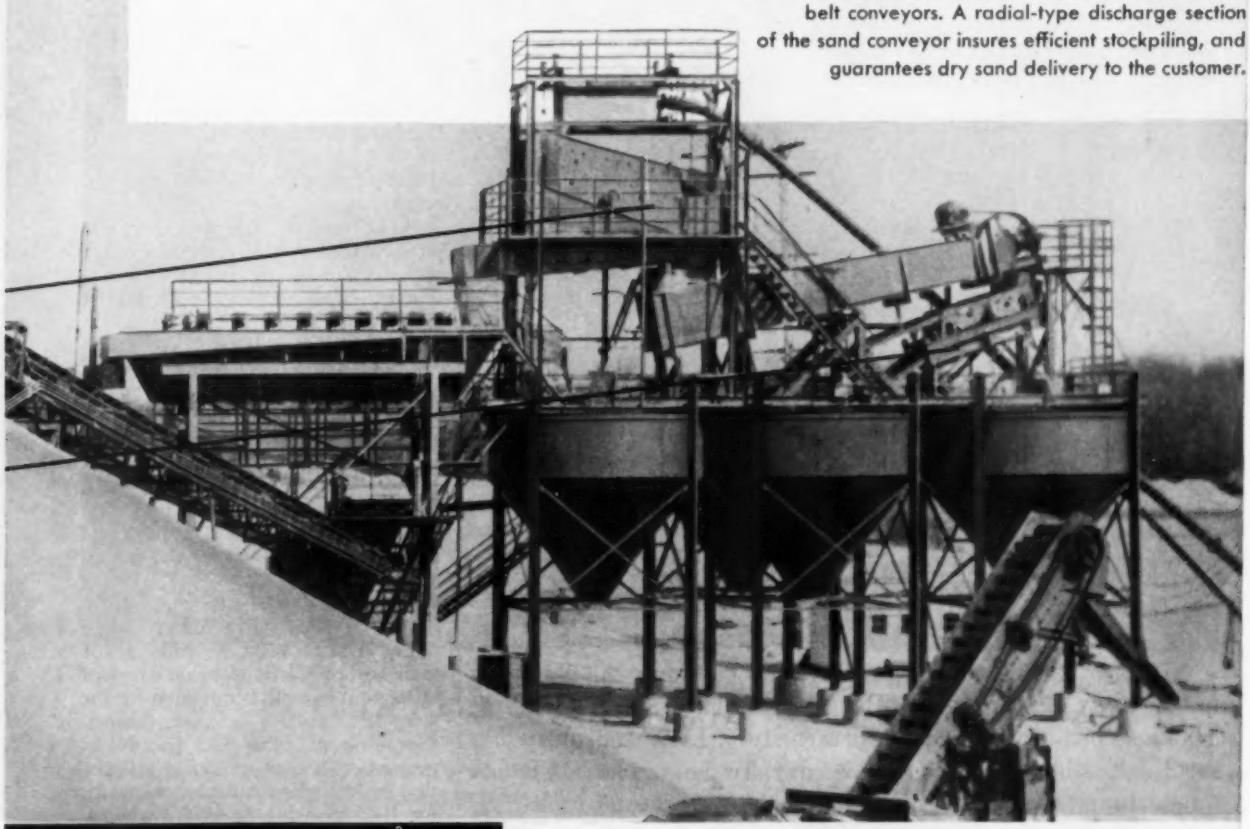
In the final phase of processing aggregates discharge from the logwasher onto a 4' x 8' Model SO triple deck unit. Here the final rinsing and sizing takes place. The top deck, 1¾" sq. opening, splits the aggregate into two concrete specifications. The second deck openings are used to assist in making any unusual gradations, but primarily to lighten the load on the third deck where small opening screen cloth eliminates the broken soft stone, coal, and slate degradation. • Write today for Catalogs #531 and #571. • SIMPLICITY equipment can increase production in your plant.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND 12, MICHIGAN

PROFITABLE SIZING WITH SCREENS

Production—125 tons/hour—with Simplicity equipment at one of the dredging operations of Boichot Concrete Products Corp., Lansing, Michigan—Louis and Donald Boichot, owners.

Averaging 125 tons hourly—with production peaks as high as 150 t.p.h.—Simplicity screens produce accurately sized aggregates and washed sand at a large dredging operation of the Boichot Concrete Products Corp. of Lansing, Mich. The 8″ pump, equipped with both a 10″ intake and 10″ discharge, delivers material 6″ x 0 to a 4′ x 12′ M-11 triple deck screen. This unit scalps off the oversize stone, and screens all sand through a 3/16″ opening screen cloth. The sized aggregate is passed through a 30′ long twin log-washer, where it is thoroughly cleaned. In turn the aggregate is discharged onto a 4′ x 8′ model BG triple deck screen for rinsing and final sizing. The sand is flumed from the 4′ x 12′ screen to a 32′ long electrically-operated purging tank, where initial dewatering of sand occurs. Sand is then introduced into two sand screw classifiers from the purging tank and passes to a stockpile via belt conveyors. A radial-type discharge section of the sand conveyor insures efficient stockpiling, and guarantees dry sand delivery to the customer.



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FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N.Y.

Write for new Simplicity Screen Cloth Catalog #67. Tells you all you'll need to know in ordering woven wire screen cloth. Immediate delivery from Simplicity's huge stock of fine quality cloth.

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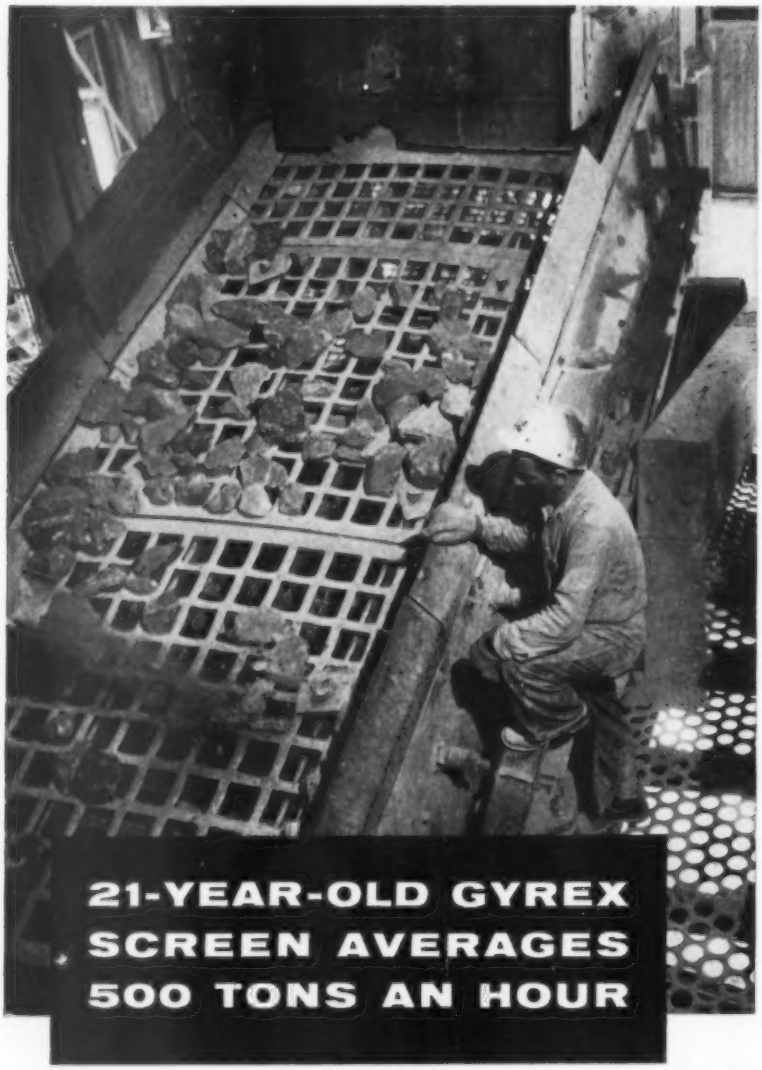


The Marble Cliff Quarries Company, Columbus, Ohio, separates 500 tons of stone an hour on a Hewitt-Robins Screen. This double-deck Gyrex vibrating unit was installed in 1936 and still has its original eccentric bearings. Main bearings were replaced only once—in 1953 after 17 years of use.

The low upkeep, design flexibility, and high over-the-years productivity of this H-R unit led Marble Cliff Quarries to install a second screen of identical capacity in 1948. And today both units still operate nine hours a day. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

past, a new city ordinance restricting the area for exclusive residences cannot stop or restrict operation of the old plant. However, the new ordinance can prevent the company from operating a new and different kind of plant.

For example, in *Berdan v. City of Paterson,* 59 Atl. (2d) 659, the testimony showed that a company had for many years been operating its present plant. The city passed a new ordinance classifying the area in which the plant is located as a residential section. After enaction of the ordinance the company applied for a permit to operate a new business in its building and premises.

The higher court held that the company could not be awarded a permit to operate the new business, but that it could continue to operate its old plant.

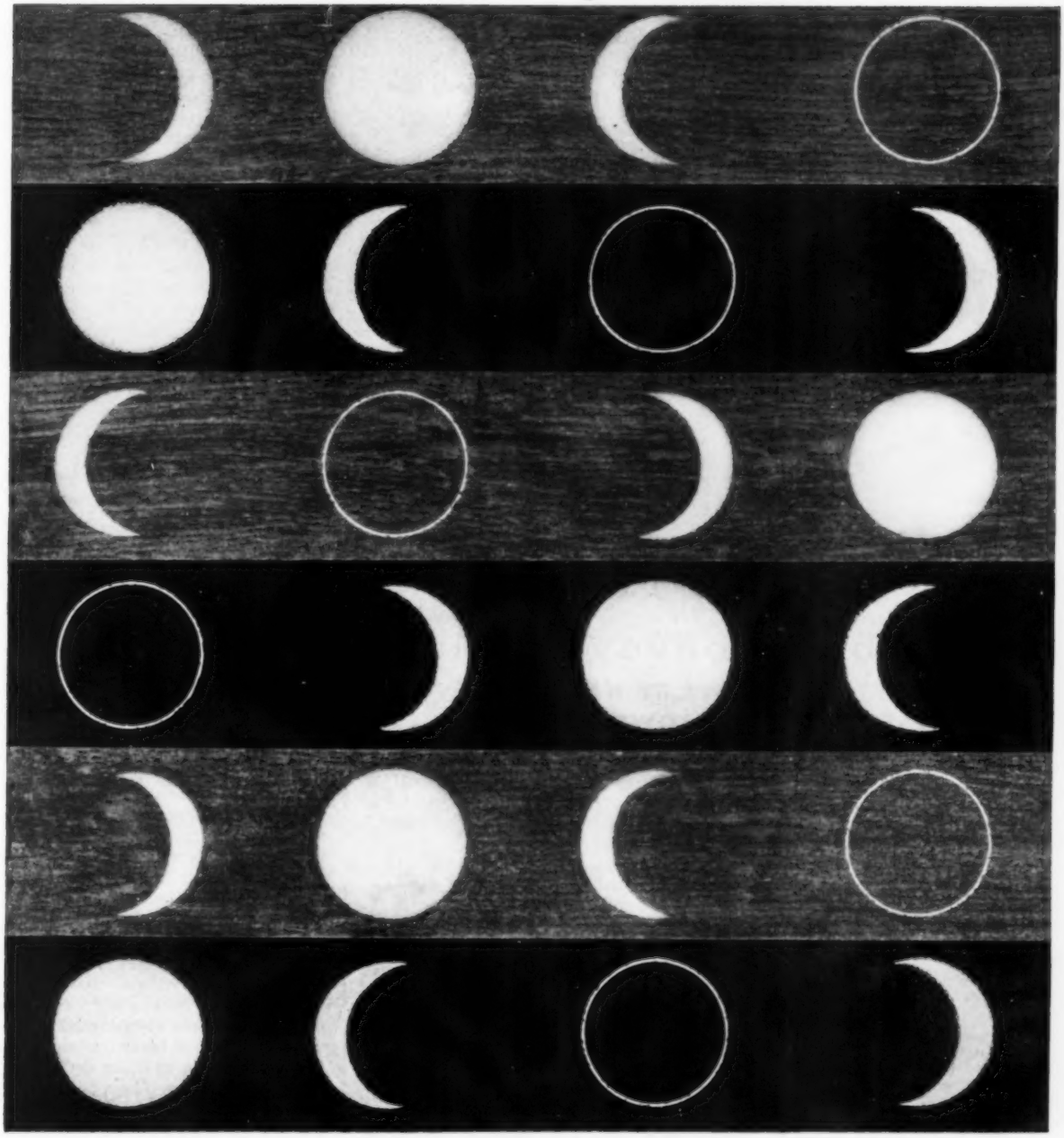
Income Tax Law

During the last few weeks, several inquiries have been received asking about the kind of testimony and evidence which the government must introduce in order to convict a taxpayer of income tax evasion. I was successful in locating a late and leading higher court decision which explains important phases of the law on this subject.

While making this review I discovered that in many instances taxpayers intentionally omit listing certain expenses, thinking that, in the event their income tax returns are audited, the government agents will overlook an apparent unintentional failure to list certain sources of income. This is bad business, and the internal revenue agents cannot be fooled by this procedure. Furthermore, several standard unique methods of arriving at net incomes are available, utilized by government agents, and approved by the higher courts.

For example, in *Clark v. United States,* 211 Fed. (2d) 100, the testimony showed facts, as follows: A man named Clark was convicted of attempted income tax evasion for the years 1945 to 1949 inclusive, through the filing of false and fraudulent returns. The government alleged that he had misstated his net income for 1945 as being $3,437.92 whereas it was $46,808.98; for 1946, as being $5,423.24, whereas it was $30,267.19; for 1947, as being $6,998.34, whereas it was $12,822.31; for 1948, as being $6,178.14, whereas it was $23,-239.96; and for 1949, as being $9,-381.67, whereas it was $25,236.69. All of Clark's income was admittedly derived from his business.

When making its decision, and the



6 months grinding time...for free

This is the bonus one cement producer got from one set of Ni-Hard ball mill liner segments.*

Unusual? Not at all. Reports from cement plants around the world show Ni-Hard** mill liner segments usually outwear chilled white iron by 100-200% . . . various steels by 50-100%. Often, results are even better.

Ni-Hard mill liner segments are available from authorized producers throughout the country. For a list of them, write Inco.

*Plant name and details on request

**Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
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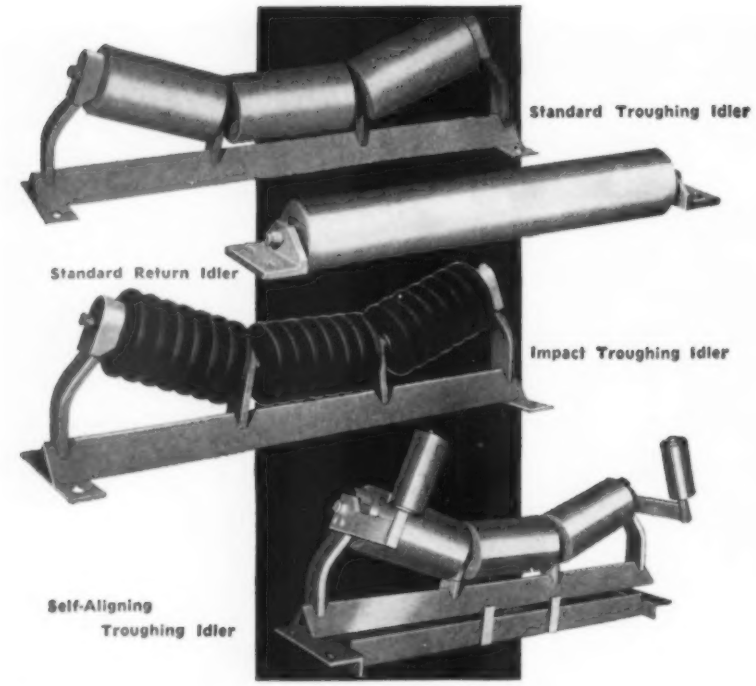
NICKEL ALLOYS PERFORM BETTER LONGER



MARCO belt conveyor idlers

INCREASE PROFITS BY HANDLING GREATER LOADS AT LOWEST COSTS...

The advanced engineering ideas incorporated in MARCO conveyor idlers will increase your production and lower your material handling costs.

For example, MARCO idlers have greater load capacity because they are designed with precision ground ball bearings, designed specifically for conveyor idlers. At 300 revolutions per minute, they will carry loads up to 860 lbs. per bearing. These anti-friction bearings give you added years of idler service life and lower power requirements.

Less maintenance: Pre-lubricated, effectively sealed bearings eliminate field lubrication. Self-shedding base keeps material build-up at a minimum. End and center brackets are ½" thick steel, die formed, to eliminate breakage.

Why settle for anything less than the proven economy and efficiency offered by MARCO idlers? Units fit any conveyor frame and are available in many types and sizes. **Ask for bulletin ID-2.**

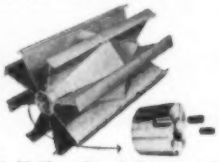
MARCO — One source for all your Conveyor Needs

Whether you need a complete conveyor, or any conveyor accessory, there is a MARCO product to meet your exact requirements. By relying on MARCO —you save time, trouble and get more for your dollar.

Get the facts from your MARCO distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

Solid Steel Pulleys
(all-steel, heavy-duty)

All MARCO pulleys offer the outstanding advantages of machined faces and Taper-Lock bushings—at a competitive price.



Self-Cleaning (wing-type) Conveyor Pulleys
(Steel fabricated, jig welded)

Pulley pays for itself many times in longer belt life by discharging 'mis-located' particles before belt can be damaged.

MARCO*

engineered MARCO products:
Tubular Frame Belt Conveyors—Conveyor Idlers—Solid Steel and Self-Cleaning Steel Pulleys—Bucket Elevators—Control Gates—Feeders—Bins.

*Trademark Reg.

amount of Clark's income tax evasion, the internal revenue agents first took the Gross Receipts of the business. From this was subtracted the Cost of Goods Sold, that is, the merchandise purchased for sale. Next was subtracted Other Business Deductions, consisting of salaries, interest, taxes, depreciation, rent, and all the other items which Clark had claimed as business expenditures in his returns. The amount remaining was treated as Clark's Adjusted Gross Income. From this, subtraction was made of the amount of the standard deduction for non-business expenses, which the Internal Revenue Code allowed, and which Clark had used in his returns, to arrive at his Net Income.

Clark appealed to the higher court, claiming that on re-examining his books he discovered that he had unintentionally failed to list numerous expenses which he now can prove were not included in his income tax return.

Clark argued, further, that while he had included some of these expenses as operating expenses, the government agents had not audited his books to find many other such expenses that he had failed to include in his income tax returns.

Nevertheless, the higher court upheld the lower court's conviction, and said:

"The government is not required to establish income tax evasion by the same processes and formalities which a taxpayer is required to observe in making his return. And it is not necessary, in order to make a case of tax evasion, that the exact amount of such income should be established. If the taxpayer legally has other deductions than those which he has so claimed, it is his privilege to show them and explain them as a part of his defense. Sometimes the failure to claim deductions in a return may well be a part of the taxpayer's scheme to cover up his unreported income as a matter of not creating suspicion on the fact of his return."

Independent Contractors

An official of a sand and gravel corporation asked this important legal question: "In your opinion is our corporation to an advantage or disadvantage when employing an independent contractor?"

The answer to this question depends upon the peculiar circumstances surrounding the employment. It is true that there is considerable legal difference between a legal employee and an independent contractor. Some of the legal differences

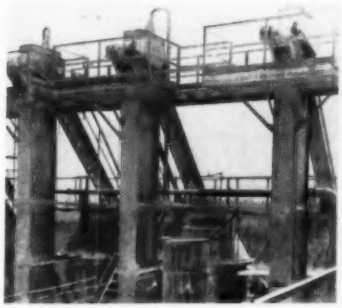
THIS WEBSTER INSTALLATION IS STILL GOING STRONG AFTER 30 YEARS' SERVICE

Webster Conveyors and Bucket Elevators are used throughout the plants of The National Lime and Stone Co., where they have earned a reputation for outstanding dependability.

Do You Have CONVEYING *Problems?*

The rough, tough service encountered in rock products plants poses many problems for plenty of producers—until they place those problems in the hands of WEBSTER Engineers.

WEBSTER Bulk Materials Handling Systems will keep your production on the move—efficiently and economically—because they are based upon "know how" gained through 81 years' experience. Webster custom-designs, builds, and installs their systems on a "satisfaction guaranteed" basis. Let us show you how we can solve your problem—no obligation—write today.



Battery of Webster Bucket Elevators handling fine limestone.

Head end of one of the 24" pitch, 42" wide Webster Super Capacity Elevators handling 10x0 stone from primary crusher.

WEBSTER MANUFACTURING, INC.
Dept. PQ-117, TIFFIN, OHIO

Offices in All Principal Cities

are that an employer is not required to pay such taxes as Social Security, State Workmen's Compensation, Unemployment, and the like on an independent contractor. Moreover, an employer is not ordinarily liable in damages for injuries to persons or property caused by an independent contractor. And an employer is not liable in damages nor for payment of compensation to an independent contractor killed or injured while performing his regular work.

For illustration, in *Boehick Company v. Industrial Commission*, 16 N. W. (2d) 298, it was shown that an owner of a motor truck rented the truck, with its driver. The owner of the truck carried the driver on his payroll, paid the driver's unemployment insurance, social security tax, and compensation insurance. The company to which the equipment was rented paid the owner a flat rate of $6 per hour and had no control over the driver.

The driver of the truck was injured and the question presented the court was: Who is liable for payment of compensation to the injured driver?

The higher court held that the owner of the truck is an independent contractor and that he is fully responsible, thereby relieving the company from any and all liability.

For comparison, see the two leading higher court cases of *Spodick v. Nash Company*, 203 N. W. 433. In both of these cases the higher court held that a new employer is liable for acts of any and all employees if he had control of these employees and directed them.

Hence, it is apparent that if a corporation rents a motor truck, machine, or other equipment from its owner, the corporation remains liable for negligent acts and injuries effected or caused by the operator of the rented equipment if the testimony proves that the corporation officials had control over the employee and gave him instructions or orders as to what he should do. Also, this higher court explained that if a corporation rents from its owner any equipment, with the operator, the corporation officials must instruct the owner of the equipment what the operator must do and then the owner of the equipment must personally convey these instructions to the operator. Under these circumstances, both the owner of the equipment and his operator, and other employees, remain the corporation's independent contractors.

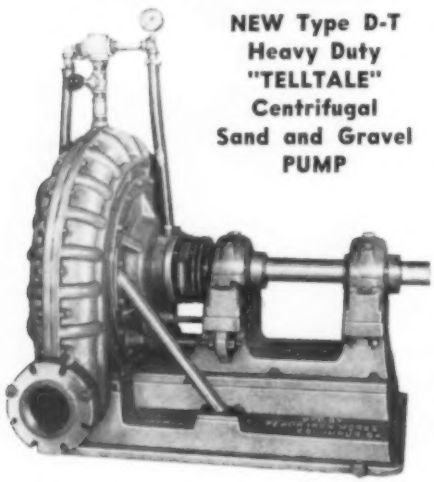
New Law Of Contracts

While attending a convention of nonmetallic materials sellers and producers, an important legal question arose. "If a buyer and seller sign a written contract by the terms of which the buyer agrees to buy from the seller a definite quantity of materials at a definite price, is the contract valid and enforceable?"

The answer is no. This is because both the buyer and seller must become mutually obligated; otherwise, no valid contract exists. This is peculiar law which very often trips up either a buyer or seller, if one knows the law and the other does not have dependable legal information.

For example, in a recent case a written contract was written by a dishonest seller who took advantage of the buyer. In this contract all terms were clearly expressed, such as time for payment, the quantity of purchased materials, the quality, and the like. The catch in the contract was that it started out by stating that the purchaser "hereby agrees to purchase from the seller," but the contract did not also state that the seller "hereby agrees to sell to the purchaser," etc., etc. In other words, while the purchaser agreed in the written contract to purchase and pay for the materials, there was no clause in the contract nor other statement to the effect that the seller agreed to sell the materials. Hence, the contract was held to be void and of no legal effect. This was so although the testimony showed that both the purchaser and the seller intended to perform the obligations of the contract at the time it was signed. Since both the buyer and seller were not mutually obligated, the court held the contract invalid.

PRODUCTION AT A MODEL SAND AND GRAVEL PLANT



NEW Type D-T Heavy Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

Noted widely for their efficient operation, Morse & Ory, Amite, La., are loading sand and gravel at a rate of five cars per hour with a 6 x 8" Type D-T Heavy Duty "Telltale" pump.

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signal that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy Duty folder and prices.

PEKOR IRON WORKS, INC.

ESTABLISHED 1892

LOCK DRAWER 909 COLUMBUS, GEORGIA

Cement Output Quadrupled In Belgian Congo in 7 Years

A survey of production statistics indicates that cement output in the Belgian Congo in 1956 was almost 20 times higher than it was in 1938, and that in the last 7 years alone, the volume was quadrupled.

Cement output in 1956 totaled 447,500 metric tons; in 1955, 405,236 tons. Production should continue to increase considerably, with three new plants beginning operations this year, a fourth in the planning stage, and a fifth being projected.

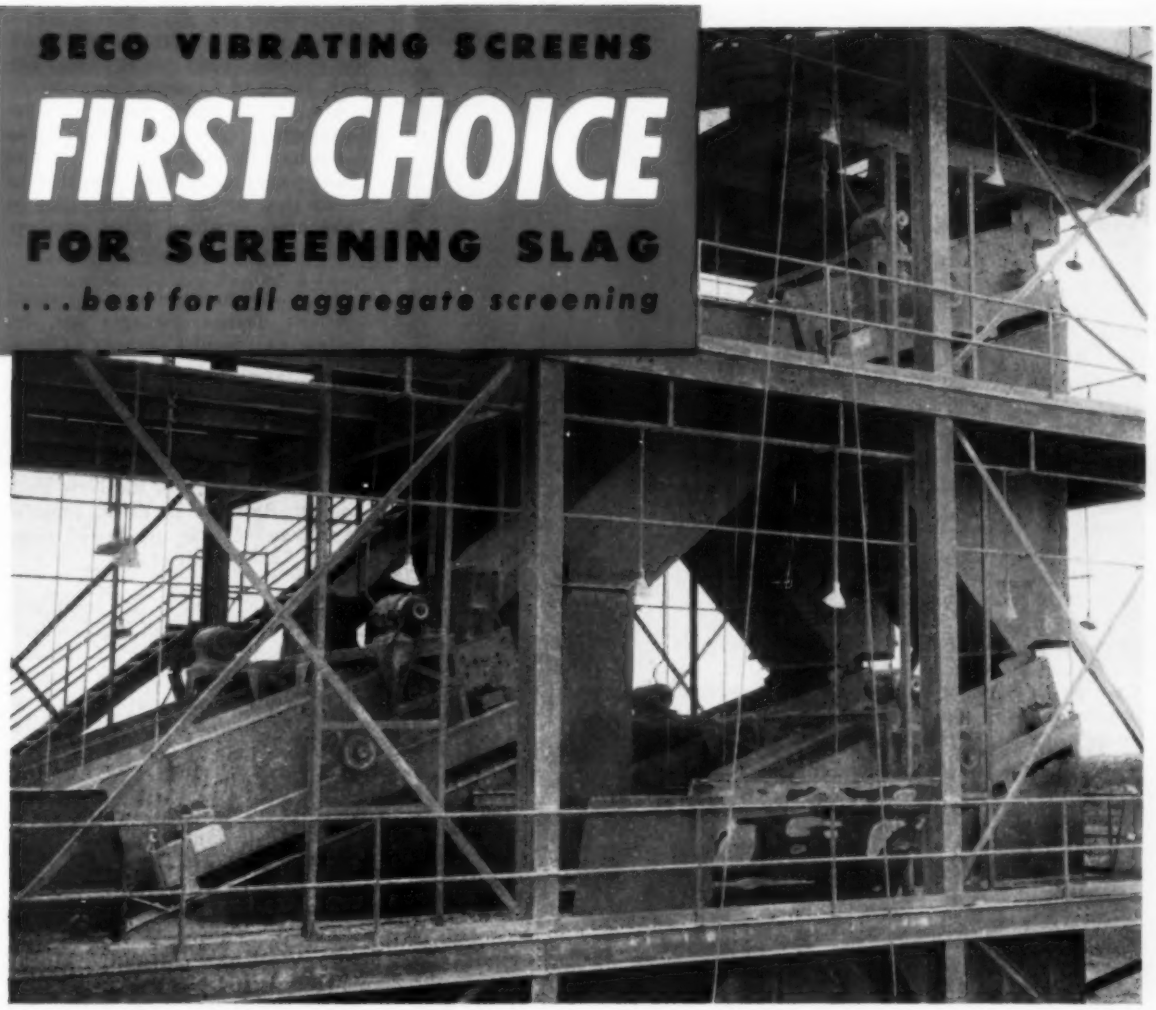
Cement production in Peru totaled 3,265,063 in 1956 compared with 3,203,329 barrels in 1955.

SECO VIBRATING SCREENS

FIRST CHOICE

FOR SCREENING SLAG

. . . best for all aggregate screening



53% OF ALL SLAG SCREENING PLANTS IN THE U.S. CHOOSE SECO VIBRATING SCREENS . . .

Why this marked preference for SECO vibrating screens among so many of the nation's leading slag producers? TWO WORDS: DEPENDABLE PERFORMANCE . . . and what important words they are. When you invest your money in equipment . . . claims don't mean a thing. Whether you're screening slag, ag-lime, stone, gravel or any other material, you want results.

You want accurate sizing, good volume and equipment that can stand the gaff when you're running long and hard during peak production seasons.

In short you want DEPENDABLE PERFORMANCE and that's why you want PERFORMANCE PROVEN SECO VIBRATING SCREENS on your job. They're FIRST CHOICE in the slag industry and FIRST CHOICE with thousands of the most successful aggregate producers in the land.

Write, wire or phone

SCREEN EQUIPMENT CO., INC., Buffalo 25, N.Y.

Whatever you Screen

SLAG • STONE
SAND • GRAVEL
AG-LIME • ORE

Do it the profitable way with SECO VIBRATING SCREENS

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SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

Industry Personalities

HAROLD K. VANDERIPE has been named state paving engineer for the Indianapolis (Ind.) district by the Portland Cement Association. A veteran of 16 years with the P.C.A., Mr. Vanderipe has served the last 9 years as field engineer in the Fort Wayne (Ind.) area.

VINCENT E. WESSELS has been named assistant to Cris Dobbins, president of the Ideal Cement Company, Denver, Colo., in a series of promotions.

New plant managers are ROBERT E. MARCH, Superior, Neb.; WARREN E. BROWN, San Juan Bautista, Calif.; and MILLARD F. BALL, Okay, Ark.

CLAUDE MCMILLAN, former plant manager at Okay, has been named assistant to the chief engineer at Ideal's Denver, Colo., plant, and RONALD E. WALLIS becomes superintendent at Sacramento, Calif.

G. B. Kirk

GEORGE B. KIRK, field service manager, succeeds the late M. C. Dailey as director of research and development at Kaiser Gypsum Company, Inc., Oakland, Calif.

Mr. Kirk will direct product development programs at the company's gypsum and insulating products divisions, and will supervise quality control projects at the company's plants at Antioch and Long Beach, Calif., St. Helens' Oreg., and Seattle, Wash.

Gerald C. Saltarelli, vice-president in charge of operations, was elected to the newly-created post of senior vice-president of Houdaille Industries, Inc., Morristown, N. J. Mr. Saltarelli has administrative responsibility for Houdaille's 13 plants and 28 construction materials producing units.

FREDERICK G. HAIGH has been named assistant plant manager of the Bunnell (Fla.) plant of the Lehigh Portland Cement Company.

Mr. Haigh joined Lehigh at the Birmingham (Ala.) plant in 1948 as a mechanical engineer; and he was made plant engineer in 1950. He was transferred to the Bunnell plant in 1954 and remained plant engineer until his present appointment.

JOHN ANDREWS has been named assistant district manager for the National Gypsum Company's Cleveland district. Mr. Andrews has been with the company for six years.

RAYMOND A. KESSEL, former assistant district manager for the Albany district, has been transferred to a similar post with the New York District. RICHARD L. TUBBS replaces Mr. Kessel as assistant district manof the Albany district.

RALPH F. CAIRNS has been promoted to supervisor of laboratory of the Freeport Sulphur Company, New York, N. Y. He was formerly chief analytical chemist at the company's laboratory at Grande Ecaille, La.

Universal Atlas Cement Company, New York, N. Y., has announced several changes in its personnel staff.

FRED E. THOMPSON, chemist, has retired from Universal's plant in Hannibal, Mo., after serving the company for approximately 49 years.

D. W. BAILEY and W. N. MORRIS have accepted positions in the New York office and the Buffington (Ind.) plant, respectively.

CHARLES HORNER, president of the Kosmos Portland Cement Company, Louisville, Ky., has been elected a director of the Flintkote Company, East Rutherford, N. J. Kosmos recently became a wholly owned operating subsidiary of Flintkote.

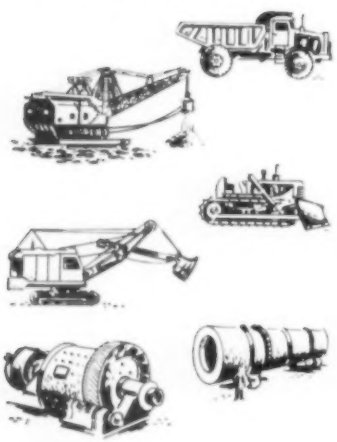
An announcement released by the Bessemer Limestone & Cement Company, Youngstown, Ohio, states that MARSHALL H. WINKLER has been appointed chief engineer, and RICHARD W. SHEETS has been named superintendent of the cement plant.

It was also announced that Finn R. J. Barre had resigned his position as chief engineer.

JAMES TOBIN has been appointed manager of the structural concrete products division of the Basalt Rock Company, Napa, Calif. He was formerly assistant division manager.

WANTED

YOUR TOUGH LUBRICATION JOBS



World-famous Whitmore Lubricants succeed where others fail. They are lubricants, not greases. Whitmore's exclusive never-duplicated formulas stop metal-to-metal contact—put wear on the lubricants instead of on costly gears, bearings, and cables. That's why manufacturers of earth, rock, coal, and ore moving and processing equipment recommend Whitmore Lubricants to give you the service they built into your equipment.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

OPEN GEARS, DIPPER STICKS, AND CAMS
Never-duplicated formulas that provide a hard finish impervious to moisture. Absolutely impossible for dust to cling to lubricated surfaces.

ENCLOSED GEAR CASES
Extremely high load carrying capacities for climatic conditions from the Tropics to the Arctic.

WIRE ROPE AND CABLES
Increases yardage life up to three times. Absolutely stops corrosion by penetrating to the cable core and eliminating internal friction.

Complete Line of Lubricants for Hydraulic Units; Torque Converters; Roller, Ball, and Sleeve Bearings; Speed Reducers.

Write for FREE samples, FREE data, FREE "on your job" engineering assistance.

THE WHITMORE MFG. CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

PAUL W. CLARK has been named California division sales manager of the Ideal Cement Company, Denver, Colo., to succeed A. A. Courteney Jr., who recently retired. Mr. Clark was employed by the Pacific Portland Cement Company in 1950, and came to Ideal when the two firms merged in 1952.

The appointment of CLAIRE F. GAUMAN to the position of general superintendent of the Cleveland Quarries Company, Amherst, Ohio, was announced recently. Mr. Gauman, who was formerly superintendent of the company's Birmingham and Wakeman, Ohio, quarries, will now be responsible for all of the firm's quarries.

Officials of the Lehigh Portland Cement Company, Allentown, Pa., have announced the appointment of GEORGE N. WHIPPLE as assistant manager of the Buffalo, N. Y., plant.

Mr. Whipple joined Lehigh in 1950 as a mechanical engineer at the Mason City, Iowa, plant. He has since served as plant engineer at the Sandt's Eddy, Pa., plant and at Buffalo.

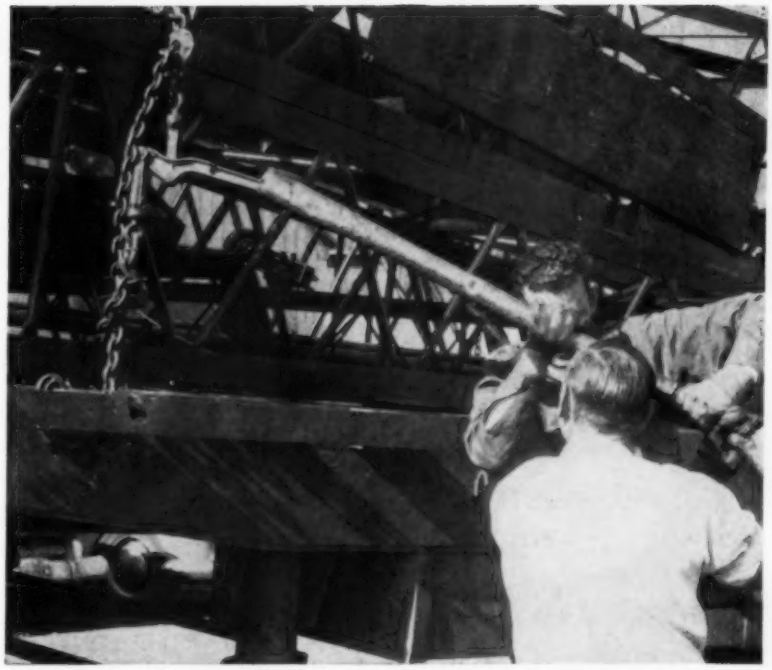
EDWARD F. STRAUSS JR., J. E. MONROE JR., M. B. SHELDON, and R. H. FEIERABEND have been elected assistant vice-presidents of the Freeport Sulphur Company, New Orleans, La.

LOYD E. PETERSON has been appointed field engineer for western Kansas with offices in Garden City, Kans., by the Portland Cement Association. He will represent a 31-county area.

United States Gypsum Company has announced three appointments to its Chicago office. They are R. W. KYLE, manager of roofing and siding products; ALAN B. COOK, marketing manager in charge of special products, a newly-created post; and PAUL W. SPLITTDORFF, field marketing manager of gypsum wallboard products.

WILLIAM R. SOULE has been named administrative assistant to Claude E. Harper, Kaiser Gypsum Company vice-president and general manager.

Mr. Soule joined Kaiser Gypsum four years ago as assistant controller. He has been with the Kaiser organization since 1941 and has held financial administrative positions with Henry J. Kaiser company and Kaiser Services.



THIS LOAD WILL STAY PUT... ACROSS TOWN—ACROSS COUNTRY

There's no doubt about the safety of this load—or any load secured with Lebus Loadbinders. Completely drop forged, then heat treated for even more strength and durability, the millions of Lebus Loadbinders already in use have proved their ability to tie down loads of every description—keep them absolutely secured without failure *until they're released!*

You get an idea of this loadbinder's strength from the photo above. Two big truckers throw their combined weight on a long cheater without fear of breaking or bending any part—they know that, from handle to hooks, the Lebus is the strongest Loadbinder manufactured. You're assured of safe, dependable performance because each Loadbinder is thoroughly proof tested before shipment.

Equally important is the Lebus Loadbinder's convenience and safety of operation. Once the binder is locked in position, it can't snap open. Even shifting loads won't spread the handle! Exclusive Lebus designed ball and socket swivel is drop forged—won't pull apart regardless of the load! Get complete details on the number one loadbinder in every industry from Crosby Laughlin Lebus Distributors!

WORKERS PROTECTED

Workers and materials are protected with Crosby-Laughlin Safety Hooks that keep the load in place *until it's released!* A rust-proof, non-jamming latch and spring provides a simple but safe method of keeping rings and slings

on the hook, even when the load is set down! Tough Crosby-Laughlin Hooks are drop forged then carefully heat treated. The result is superior strength and quality from a design that eliminates excess weight. Crosby-Laughlin safety and standard hooks are available in eye, hoist, shank and swivel types to give you the exact design you need. Capacities range up to 20 tons! See your nearby distributor for catalogs and technical information on a complete line of fittings!

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN *Division*

FT. WAYNE 1, INDIANA

The appointment of three new sales representatives was announced by the Zonolite Company, Chicago, Ill.

JOHN E. SCHOTEMEYER will contact architects, engineers, and contractors in and around St. Louis, Mo. He was formerly with Granco Steel Products Company and Johns-Manville Sales Corporation.

LARRY DI CAMPO will also serve the St. Louis area. He has held sales positions with several Missouri concerns.

JAMES CINTANI, with Zonolite for four years, most recently as office manager at the Ellwood City (Pa.) plant, is now salesman for northwestern Pennsylvania and three adjoining counties in New York state.

Spokesmen for the National Gypsum Company recently announced two promotions in the sales department.

ROBERT B. BELKNAP and RICHARD E. DONNERMEYER were named assistant district managers for the Omaha (Nebr.) and Kansas City (Mo.) districts, respectively.

A. E. JENKINS, following his election as a director of the British Columbia Cement Company, Ltd., Victoria, B. C., Canada, has been appointed vice-president in charge of sales, with headquarters in the Vancouver (B. C.) offices of the firm.

Mr. Jenkins was formerly manager of the concrete division at Evans, Coleman and Evans, Ltd., Vancouver.

RICHARD E. WAYMAN and WILLIAM G. WINTERS have been appointed to the sales and service staff of Basic Incorporated, Cleveland, Ohio.

Mr. Wayman will be located in the Hammond (Ind.) office and will deal with Midwestern steel producers Prior to joining Basic, he was associated with the metallurgical department of Inland Steel Company.

Mr. Winters, formerly an experimental engineer for Towmotor Corporation, will assist in handling service assignments in the central region. His headquarters will be in Cleveland.

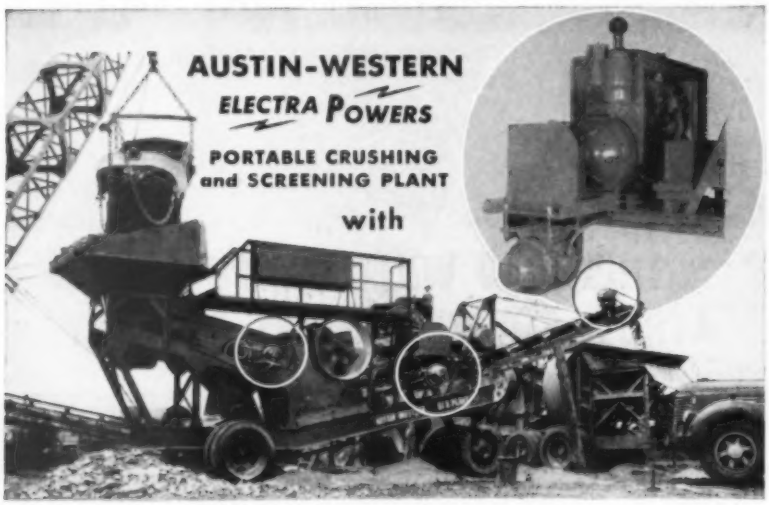
The Ideal Cement Company, Denver, Colo., has announced several personnel changes in its production department.

JAMES C. ANDREWS, formerly plant manager at Boettcher, Colo., transferred to Denver as chief production engineer.

Replacing Mr. Andrews is DONALD F. CARLSON, former plant manager at Trident, Mont.

VICTOR H. SZIDON, formerly assistant plant manager at Ada, Okla., takes over Mr. Carlson's position.

JOHN RELIC JR., maintenance supervisor at Gold Hill, Oreg., assumes the Ada post.



WINPOWER GENERATORS

Baldwin-Lima-Hamilton Corp.,—Construction Equipment Division—Lima, Ohio, manufacturers of AUSTIN-WESTERN crushing and screening equipment shown here, use WINPOWER generators for electric power. They know that by using WINPOWER powered electric motors and speed reducer drives on conveyors, feeders and screens they can eliminate long drive belts and drive shafts, expensive to buy and difficult to replace in case of failure in the field. *Whatever* your need there is a WINPOWER Generator for you. Generators as well as gasoline or diesel powered electric plants in capacities from 400 watts to 100 KW. You can save time and money with WINPOWER. See your WINPOWER Distributor or phone, write or wire at once for complete illustrated folder and specifications.

WINPOWER MFG. CO.
NEWTON, IOWA • U.S.A.

Obituaries

ROBERT G. RAUSCHER, 64, former vice-president and comptroller of the Warner Company, Philadelphia, Pa., died recently after a long illness.

ERNEST T. TRIGG, 80, a member of the board of directors of the Warner Company, Philadelphia, Pa., for many years, died recently at his home in Malvern, Pa.

CARL VINES, assistant to the president of the Mississippi Valley Portland Cement Company, Jackson, Miss., died recently after a heart attack at his home in Jackson.

A **Buell Cyclones** offer exclusive Shave-off which harnesses double-eddy currents and puts them to work, large diameter design which eliminates bridging and clogging.

B **Buell "SF" Electric Precipitator** delivers extra collection efficiency through use of unique high emission, selftensioning Spiralectrodes and exclusive Continuous Cycle Rapping.

C **Buell Combination Cyclone-Precipitator Systems** combine exclusive Buell features for extra efficiency where extremely high performance standards must be met.

Which is the best dust collection system?

Five factors influence the choice of a dust collection system: dust characteristics, gas characteristics, efficiency required, installation and operation costs, and limitations of space or draft loss. In every installation, exclusive Buell features provide *extra efficiency*. A booklet, "The Collection and Recovery of Industrial Dusts", provides valuable, specific details. Just write Dept. 18-L, Buell Engineering Company, Inc., 123 William St., New York 38, New York

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Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.

ESTABLISHED 1881

Manufacturers' News

The Dayton Rubber Company, Dayton, Ohio, is distributing a new link type V-belting to further expand its complete industrial line of V-belts for all types of power transmission drives.

Known as Thoro-Link V-belting, the new link belting is said to be extremely flexible and will operate efficiently over small sheave diameters. Each link is pre-stretched under controlled tension. Reinforced rivets provide a positive lock-fit.

Thoro-Link V-belting comes in all sizes in both regular and oil-proof construction to cover every type of application. The regular belting, red in color, is for use on the average installation requiring a standard FHP or multiple V-belt drive.

E. F. Fisher, president of Gar Wood Industries, Inc., Wayne, Mich., has announced plans for the operation of a new plant at Exeter, Pa., for the production of Gar Wood—St. Paul dump truck bodies.

JOSEPH M. FRANZ has been named Philadelphia District sales manager by the Harbison-Walker Refractories Company, Pittsburgh, Pa. A member of Harbison-Walker's sales organization since 1924, Mr. Franz was most recently located in the firm's Detroit District office.

J. M. Franz

M. T. Gilkison

MARK T. GILKISON has been promoted to manager of the Industrial Sales Division, Gates Rubber Company, Denver, Colo. In his new position, Mr. Gilkison heads the entire Gates Industrial Sales organization, which includes all original equipment manufacturers and the industrial replacement market through distributors.

A member of the Gates Rubber Co. since 1939, Mr. Gilkison has served as assistant manager of the Division for the last eight years.

FRED ZIMMERMAN, vice-president in charge of sales, Broderick & Bascom Rope Co., St. Louis, Mo., has retired after 46 years with the firm.

Well known throughout the wire rope industry, Mr. Zimmerman joined the company in 1911 at the St. Louis factory and has been associated in sales of Broderick & Bascom products since that time. He became sales manager in 1930 and vice-president in charge of sales in 1951.

DR. OTTILIE AMMINGER has been appointed chief metallurgist of the Leschen Wire Rope Division, St. Louis, Mo. In her new position, Dr. Amminger will be responsible for quality control and the new metallurgical laboratory in the Leschen wire-drawing mill presently under construction.

▲ TOP: This 7'-0 x 30'-0 rotary dryer removes excess moisture. Dryer is oil heated.

RIGHT: The lifters, with their unique cup-like design and their staggered arrangement in the unit, cause the sand particles to be evenly distributed and greatly increase the capacity and efficiency of the dryer. ▶

A McDermott Dryer Installation at the North American Refractories Plant at Little Gap, Pa.

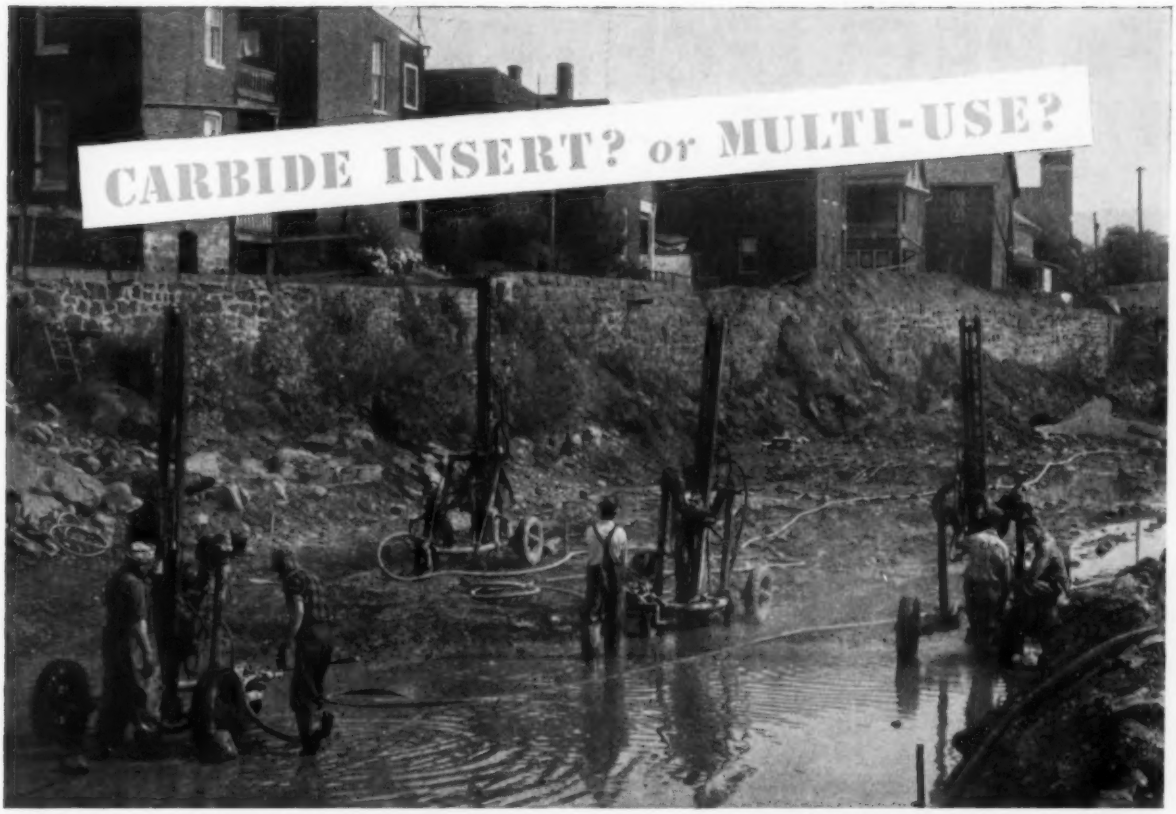
Sound Engineering Economy and Consistently Superior Performance Are Built Into All McDermott

Dryers • Coolers • Kilns

McDERMOTT BROS. CO.

Allentown Pennsylvania

Phone HEMLOCK 3-3231



LOCATION: *Flood control project on Will's Creek, Cumberland, Md.* **OPERATING CONDITIONS:** *Soft to medium limestone*

TIMKEN® multi-use bits most economical, gave lowest cost per foot-of-hole in Maryland flood control project

. . . says E. J. Albrecht Company of Chicago, Illinois

IN drilling through soft to medium limestone on a flood control project in Cumberland, Md., E. J. Albrecht Co. got lowest cost per foot-of-hole with Timken® multi-use rock bits. With correct and controlled reconditioning, Timken multi-use bits give the lowest cost per foot-of-hole when full increments of steel can be used in ordinary ground.

But in hard, abrasive ground, Timken carbide bits would have been the best bit to use. They give you higher speeds and greater economy in extremely deep holes, constant gauge holes, small diameter blast holes.

Both Timken multi-use and carbide insert bits are time-savers. They're interchangeable in the same thread series. Dozens of different bits fit the same drill steel. Bit-changing goes fast and easy right on the job.

Timken rock bits are made from our own electric furnace fine alloy steel. And they have special shoulder unions to protect threads against drilling impact.

For help in selecting the best type bit for your jobs, to cut your drilling costs, write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit for every job

See the next Timken Televent hour, "The Innocent Years" over NBC-TV, Thursday night, November 21st.

FARRELL-CHEEK
"One Source Supply" for
ELEVATING and CONVEYING NEEDS

FARRELL-CHEEK STEEL CO.

HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS

F-C HARD EDGE STEEL CASTINGS

F85 STEEL CASTINGS

RAILROAD CASTINGS Locomotive and Car R. R. Specialty Castings

ELEVATOR, CONVEYOR PARTS Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers, Bushings.

GEARS AND PINIONS "True Tooth" Gears and Pinions, Sheaves and Wheels.

CRANE WHEELS Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

STOKER PARTS Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

WILLIAM S. ALEXANDER has been appointed sales representative for the Wire Rope Division of John A. Roebling's Sons Corporation, Trenton, N. J. Mr. Alexander's territory includes Georgia and North Florida. His headquarters are at the firm's Atlanta district office, which is headed by Fred H. Ueckermann.

W. S. Alexander

H. S. Schweinsberg

HARRY S. SCHWEINSBERG has been appointed assistant general sales manager of the Harbison - Walker Refractories Company, Pittsburgh, Pa., with headquarters at the home office in Pittsburgh. Formerly sales manager of the company's Philadelphia District, Mr. Schweinsberg has been with Harbison-Walker in various sales capacities since 1924.

Vail Rubber Products Corporation, 1814 Summer Street, Hammond, Ind., has been appointed as an Accredited Stocking Distributor of the Republic Rubber Division, Lee Rubber & Tire Corporation, Youngstown, Ohio.

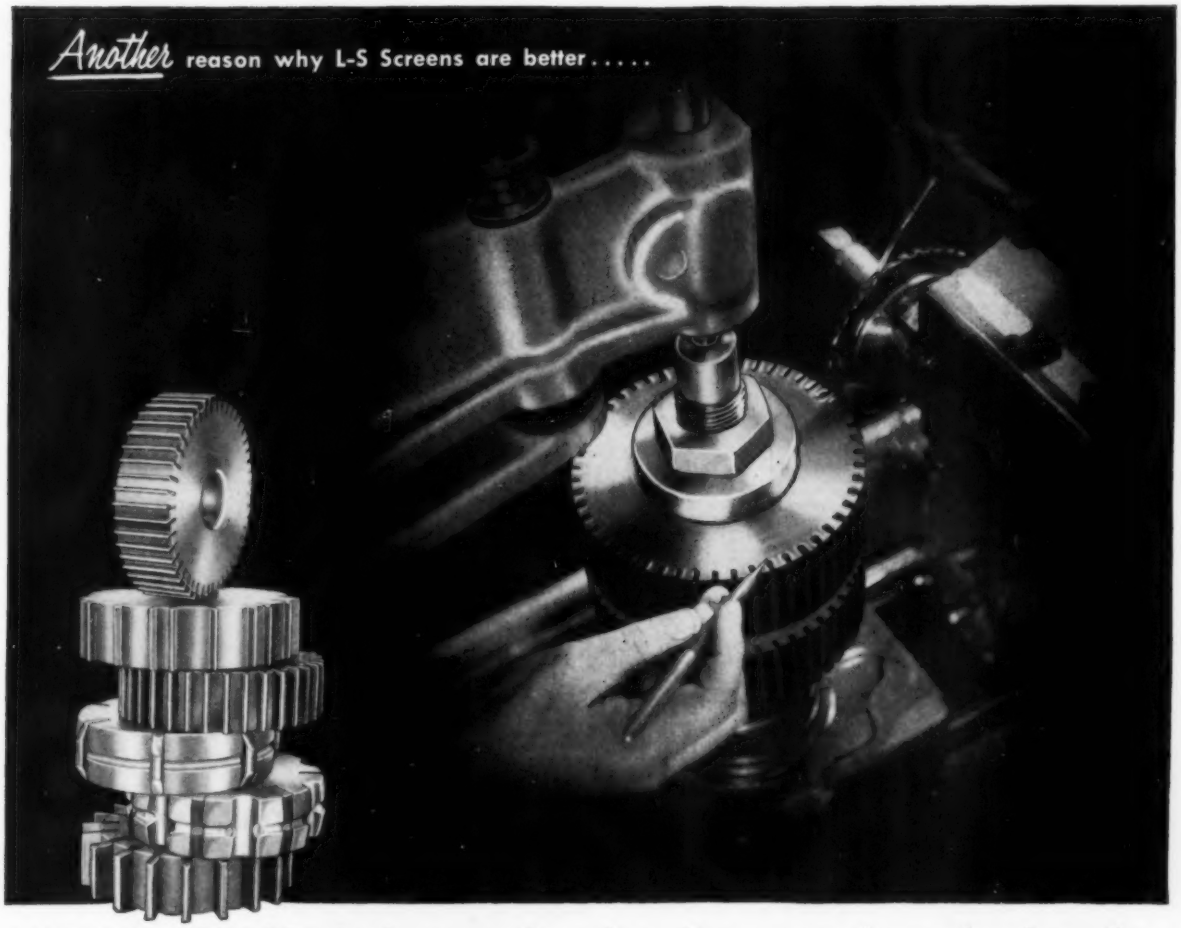
Vail Rubber will carry a complete stock of Republic's line of belting, hose, and sheet rubber, and will serve in Lake and Cook counties in Illinois, and Lake, Porter, and La Porte counties in Indiana.

Air Reduction Sales Company, New York, N. Y., has acquired Adelson - Werts, Inc., of Hartford, Conn. An authorized dealer for Air Reduction since 1948, the Hartford firm now operates as an exclusive Airco store.

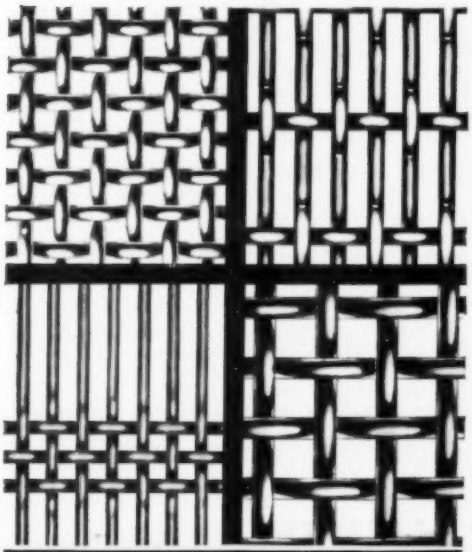
W. S. Nott Company, Minneapolis, Minn., has been named exclusive distributor for United States Rubber Company's mechanical goods division throughout the Upper Midwest. Industrial distribution area of the company includes Minnesota, North Dakota, South Dakota, western Wisconsin, Michigan, and Montana.

(*Continued on page* 200)

Another reason why L-S Screens are better.....



LUDLOW-SAYLOR designs and makes its own wire crimping dies to insure precision weaving and dimensional stability



Ludlow-Saylor Screens and Wire Cloth can be furnished of stainless, oil-tempered, high-carbon, monel, bronze, copper, brass, or any other wire.

No guesswork here! It takes practical engineering knowledge of all the physical and chemical characteristics of many kinds of wire, production know-how and skillful tool-making ability, plus critical supervision to design and produce L-S wire crimping dies.

The care in crimping die production is typical of every phase of Ludlow-Saylor manufacture that makes L-S Super-Loy Screens tougher and stronger, more rigid and accurate. They wear longer, stand up better under every operating condition —yet cost no more than ordinary screens.

Specify L-S Screens to get a higher quality, more uniform, lower-cost product.

***Immediate Shipment* of most weaves and sizes**

Write for Condensed Screen Reference Catalog

Ludlow-Saylor

WIRE CLOTH COMPANY

SINCE 1856

601 S. Newstead Ave. • St. Louis 10, Mo.

SALES OFFICES: Birmingham, 1727-6th Ave. N.; Chicago, 5708 W. Diversey; Pittsburgh, Union Trust Bldg.; Houston, 1213 Capitol Ave.; Denver, 1530 Carr St. WEST COAST SUBSIDIARY: Los Angeles, Star Wire Screen and Iron Works, Inc., 2515 San Fernando Road.

Fast 2½-yd. Manitowoc Model 3500 shovel loads over 100 20-ton truck loads of limestone a day for well-known Illinois cement producer.

Plant output depends on your shovel . . .

that's why . . .

Manitowoc pays off in the pit!

The shovel in your pit is a primary producer with plant production closely geared to its output. That's why you need a real rock shovel — one that can consistently put out the necessary tonnage to keep your plant operating at top efficiency.

Manitowocs fulfill every requirement for rugged quarry service — smooth, steady power flow; fast cycle speed; and the work capacity to load out rock on a round-the-shift schedule.

Simple design throughout channels all useable horsepower directly to the dipper — provides greater line pull for an added margin of power. Disc-type swing and travel clutches assure smooth, precise performance without jerking or grabbing. Underslung dipper sticks mesh firmly against drive pinions due to upward pressure when digging . . . Sticks slide through saddle blocks on four adjustable rollers to eliminate wasted power. Extra-heavy construction of the wide-spread crawler base and massive carbody give every Manitowoc a solid foundation for the toughest digging.

These are only a few of the reasons why you see more and more Manitowocs in quarries everywhere. For added facts and figures on the entire profitable line, call your Manitowoc distributor *now*.

ADDS POWER BY SAVING POWER
Only Manitowoc gives you a unique "Slide Pinion" arrangement which effectively reduces the number of gears and pinions needed in the main machinery. Eliminates power loss through unused gear trains — directs full power flow to the operating function.

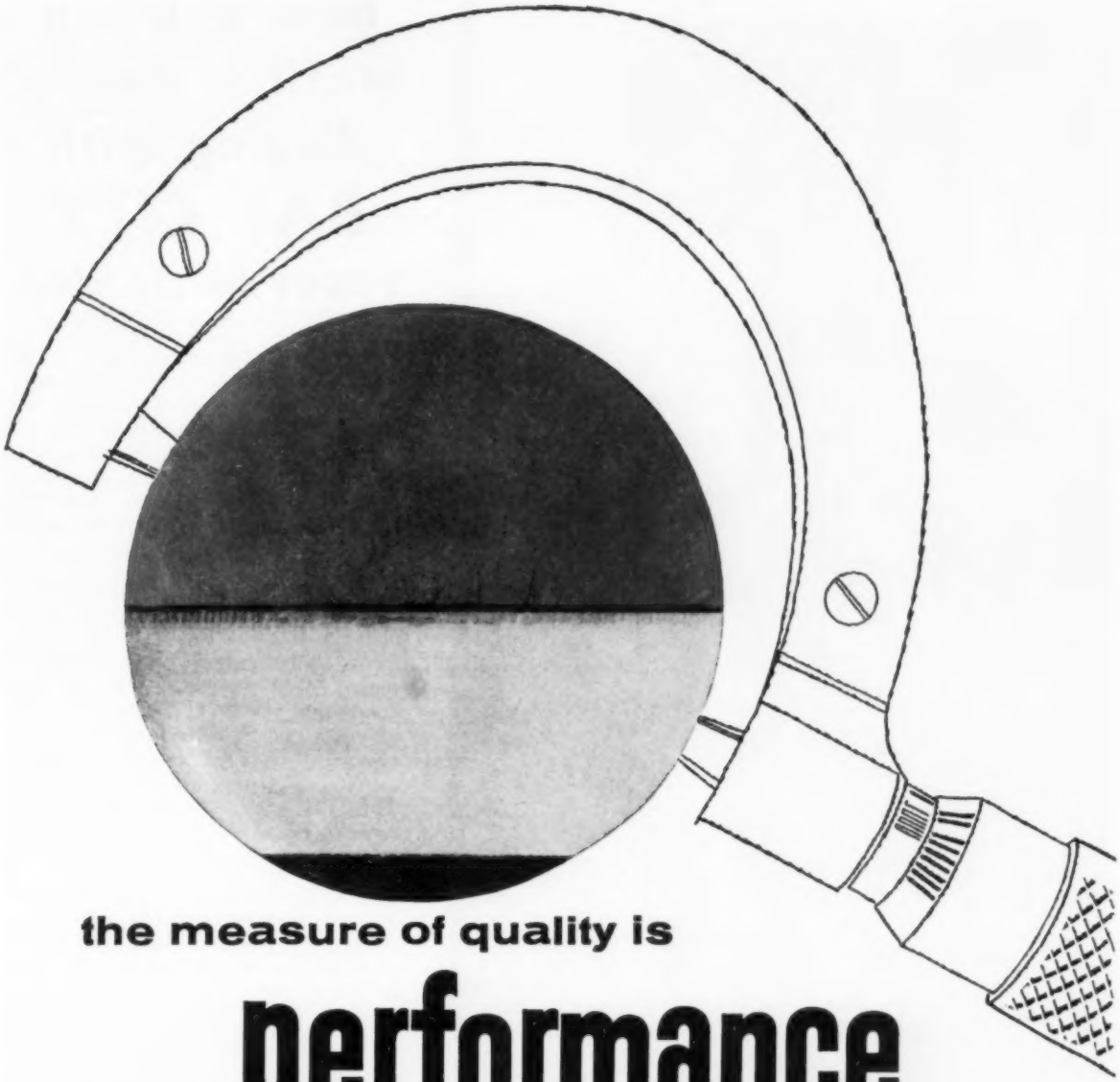
TORQUE CONVERTER REDUCES PEAK LOADS
Here's smooth power delivery of twice normal torque with maximum engine efficiency at all times. Eliminates peak loads throughout gear train due to quick drum speed changes — extends cable life — reduces machine downtime.

STAYS ON THE JOB LONGER
Manitowoc gives you extra years of big yardage production — lower maintenance cost. Enclosed gears run in oil; there are fewer wearing parts — fewer replacement of parts; balanced design evenly distributes digging stress.

Manitowoc

SHOVELS 1-5½ YD. • CRANES 20-100 TON

MANITOWOC ENGINEERING CORP.
Manitowoc, Wisconsin



the measure of quality is

performance

Moly-Cop Grinding Balls perform superbly on toughest grinding jobs because they have the necessary hardness to stand up to the long economical grind. They wear evenly because of that hardness which is uniform right to the core. That's the result of technological control in alloying, forging and heat treating by Sheffield. And the reason why Moly-Cop Balls are THE STANDARD OF COMPARISON AROUND THE WORLD.

SHEFFIELD

ARMCO®

MOLY-COP

COPPER-MOLYBDENUM-ALLOY

Grinding Balls

SHEFFIELD DIVISION ARMCO STEEL CORPORATION SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA

EXPORT REPRESENTATIVES, THE ARMCO INTERNATIONAL CORPORATION, MIDDLETOWN, OHIO

how you can profit in heavy digging with BAY CITY reserve power

Just look at the 1 yard rock dipper in this striking action photo—filled to brimming capacity. The 21-foot, heavily reinforced box-type welded boom wields this mighty load with ease and speed. The one-piece continuous chain crowd has automatic tension adjuster and a power dipper trip gives effortless dumping. Reverse crowd mechanism, too, is power controlled.

In any heavy digging, you need power and lots of it. You'll have reserve power to spare with the BAY CITY Model 60, thanks to its husky, 113.5 hp GM diesel engine. And, for maneuverability, you can't beat a BAY CITY. It provides a well-balanced assembly with all machinery and engine mounted on a one-piece, heat-treated cast rotating base. Powerful shoe-type swing clutches combined with balanced hoist and crowd speeds provide smooth operation and a fast digging cycle.

Your heavy digging and material handling will increase profitably; your maintenance and downtime drop off sharply, when you use dependable, powerful BAY CITY equipment.

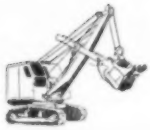
270

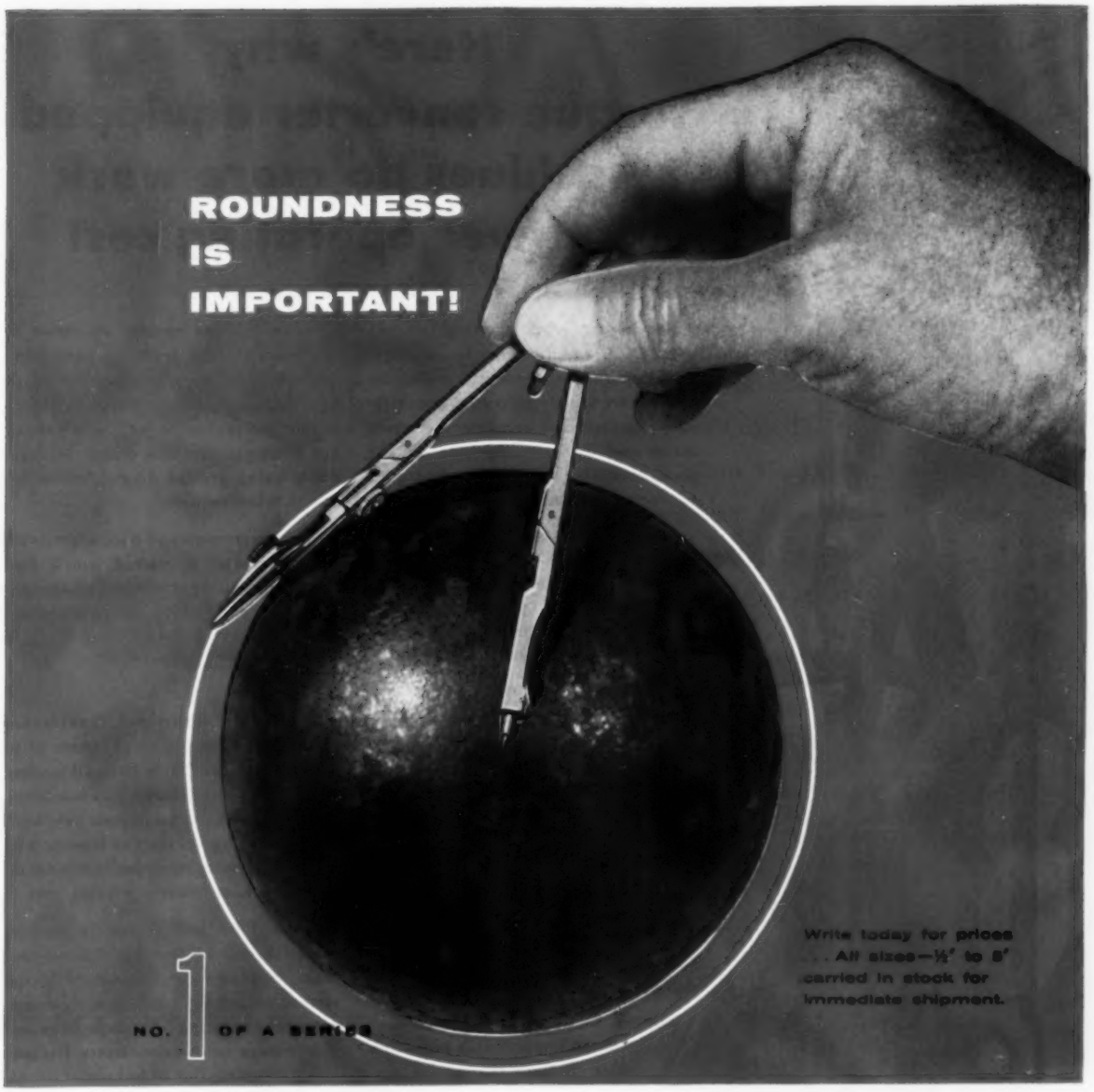
Write today for Bulletin 60-B. Gives complete specifications and working ranges for the fully-convertible 1 yard Model 60 with 21 ton crane rating.

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS





The more perfectly round a grinding ball is the better it grinds and the longer it lasts—deviations reduce its efficiency. Coates has established a reputation for the roundness of its Carbex Triple-Forged Grinding Balls which dates back to 1918 when they patented a process for the first round grinding ball. Great care and skill are employed in the manufacture of these superior products. More perfect sphericity assures you a ball that wears evenly and grinds better, longer. Continued checks and calibrations throughout the manufacturing process protect the high standards and assure uniformity.

Coates Carbex Grinding Balls are made of fine-grained, high-carbon steel. Scientifically heat treated to the core, they are hard, to last longer and to grind better; tough, to avoid shattering under stress of milling. Call for Coates Triple-Forged Carbex Grinding Balls . . . built with care for longer wear.

C857-3

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

COATES STEEL PRODUCTS COMPANY

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

Here's why torque converter equipped machines do *more* work at *lower* operating cost

For higher work capacity on any given load, and for greater all-round daily production, more and more contractors are specifying torque converter drives in their new excavators, erecting cranes and loaders. And here are five good, profitable reasons why the torque converter is the preferred type of drive:

1. The torque converter eliminates lugging and stalling . . . permits engines to work at maximum efficiency delivering constant high-horsepower output for heavy digging loads and fast swinging.

2. *Smooth* converter power reduces peak loads throughout the machine's drive train because fluid within the converter absorbs much of the impact energy caused by quick drum speed change . . . thus protecting *both* driving and driven equipment.

3. When necessary, the torque converter smoothly delivers approximately twice normal torque to the drum, which, at slow digging speeds, represents an important advantage in power delivered to the dipper.

4. Cable life is extended since no sharp impact loads ever reach cables through the torque converter . . . constant line tension is maintained . . . there's no jerking or snapping.

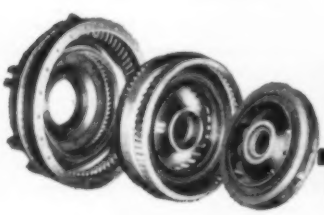
5. An infinite variety of ratios is available to work with . . . permitting smooth, accurate, *safe control* of loads and delicate "inching" and "holding" under power . . . as well as adjusting for wide variations in dipper loading, substituting greater digging effort for speed, when required.

Wherever earth and rock are moved, wherever steel is erected, you'll find contractors using these five advantages . . . *to convert their horsepower into greater-than-ever profits!*

• • •

Twin Disc Torque Converters—*three-stage* or *single-stage*, from 30 to 1000 hp—are available from all leading manufacturers of heavy-duty machines. Be sure to specify one in your next unit. Take advantage of the five reasons why torque converter equipped machines do *more* work at *lower* operating cost.

Twin Disc is the world's leading manufacturer of friction clutches and fluid couplings for heavy-duty industrial applications . . . and the only manufacturer producing *both* three-stage *and* single-stage torque converters. Because of its complete line of industrial drives, Twin Disc can offer *unbiased* recommendations for any heavy-duty power transmission application.



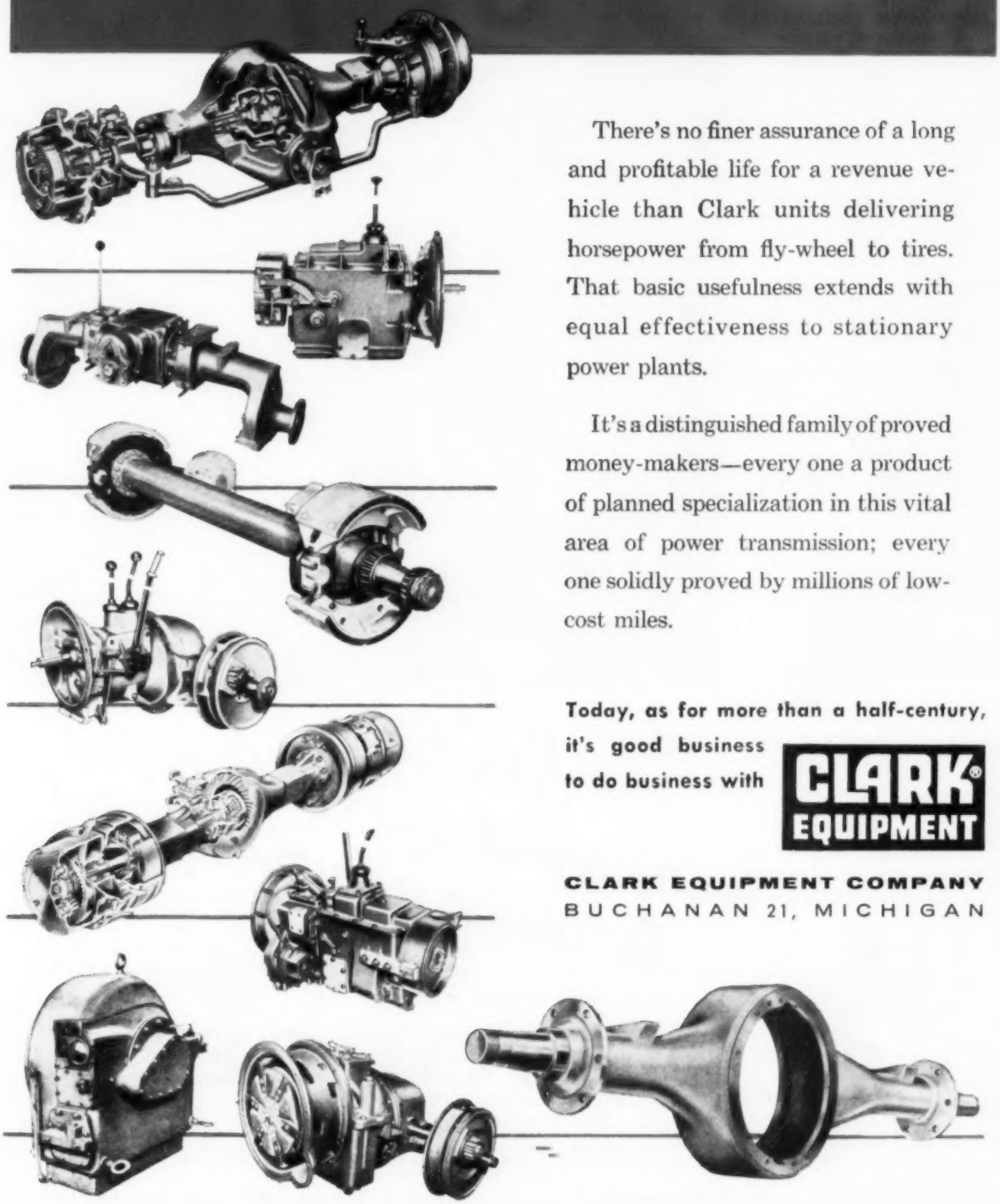
TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA

From fly-wheel to drive-wheel
. . . let it be CLARK



There's no finer assurance of a long and profitable life for a revenue vehicle than Clark units delivering horsepower from fly-wheel to tires. That basic usefulness extends with equal effectiveness to stationary power plants.

It's a distinguished family of proved money-makers—every one a product of planned specialization in this vital area of power transmission; every one solidly proved by millions of low-cost miles.

Today, as for more than a half-century, it's good business to do business with

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
BUCHANAN 21, MICHIGAN

TAPER-LOCK SOLID STEEL CONVEYOR PULLEY

1

DRUM DESIGN
— maximum strength
— minimum weight

2

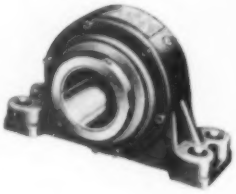
FULLY ENCLOSED
no dust — no dirt — no water

3

SUBMERGED-ARC PROCESS
— full strength in all welds

4

TAPER-LOCK BUSHING
— no walking on shaft
— easy on — easy off!



DODGE-TIMKEN ALL-STEEL PILLOW BLOCK

5

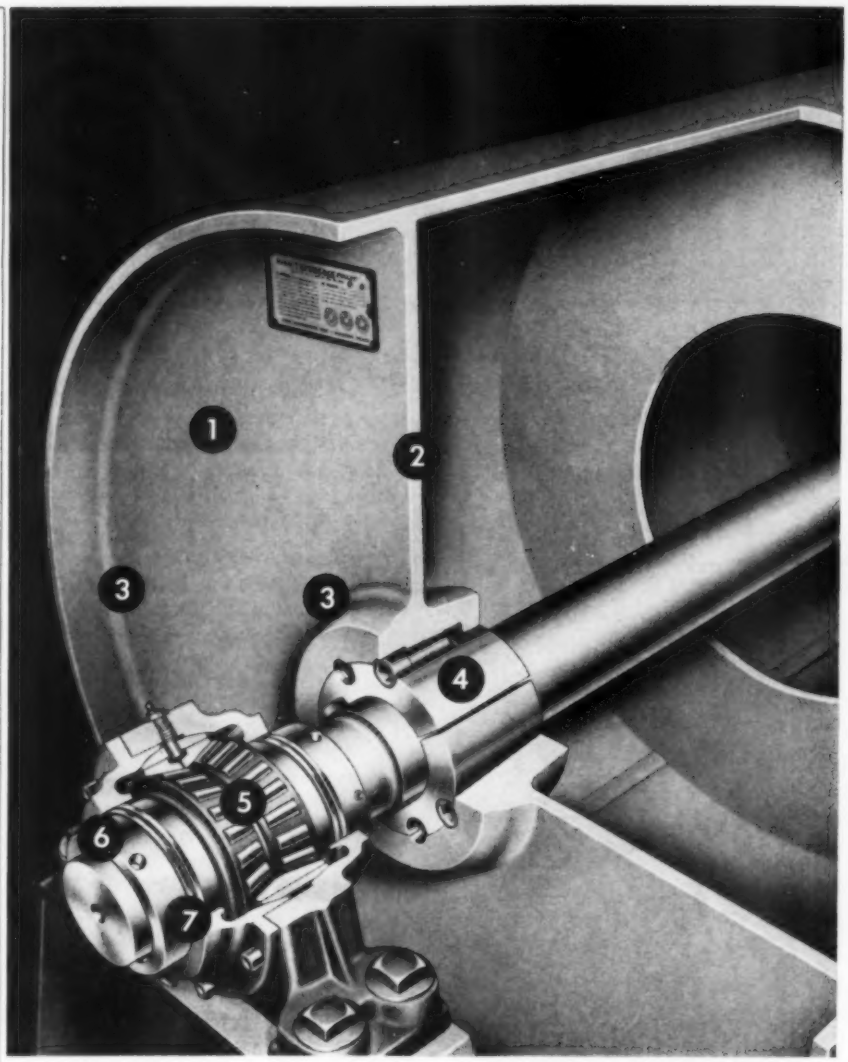
NEW HEAVY-DUTY TIMKEN ROLLER BEARINGS
— fully self-aligning

6

HEAVY-DUTY ADAPTER MOUNTING

7

Sealed both on and off the shaft with DOUBLE PISTON RINGS



Here's a heavy-duty combination for tough conveyor jobs!

Pulleys from 6 in. to 8 ft. in diameter, all face widths. Bearings from 2 15/16" to 10" bores. Popular sizes stocked by our Distributors. Write for detailed information.

DODGE

of Mishawaka, Ind.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE MANUFACTURING CORPORATION, 4000 UNION STREET, MISHAWAKA, INDIANA

ALLIS-CHALMERS ENGINES MATCH YOUR NEEDS

MATCH YOUR PERFORMANCE STANDARDS — with Allis-Chalmers high-torque, high-usable-horsepower engines that *stay on the job.*

MATCH YOUR POWER REQUIREMENTS - from a wide range of sizes and types, 9 to 516 hp. Specify or install them in *all* your equipment.

MATCH YOUR FUEL SITUATION — There are Allis-Chalmers engines for any fuel you choose — diesel, LP gas, natural gas, or gasoline.

MATCH YOUR SERVICE NEEDS — with close, fast parts and service, wherever you are. Your Allis-Chalmers engine dealer has a full stock of parts, factory-trained servicemen and complete facilities to give you prompt service in his shop or on your job.

See your Allis-Chalmers dealer for full information on engine power and service matched to your needs. Allis-Chalmers, Buda Division, Milwaukee 1, Wisconsin.

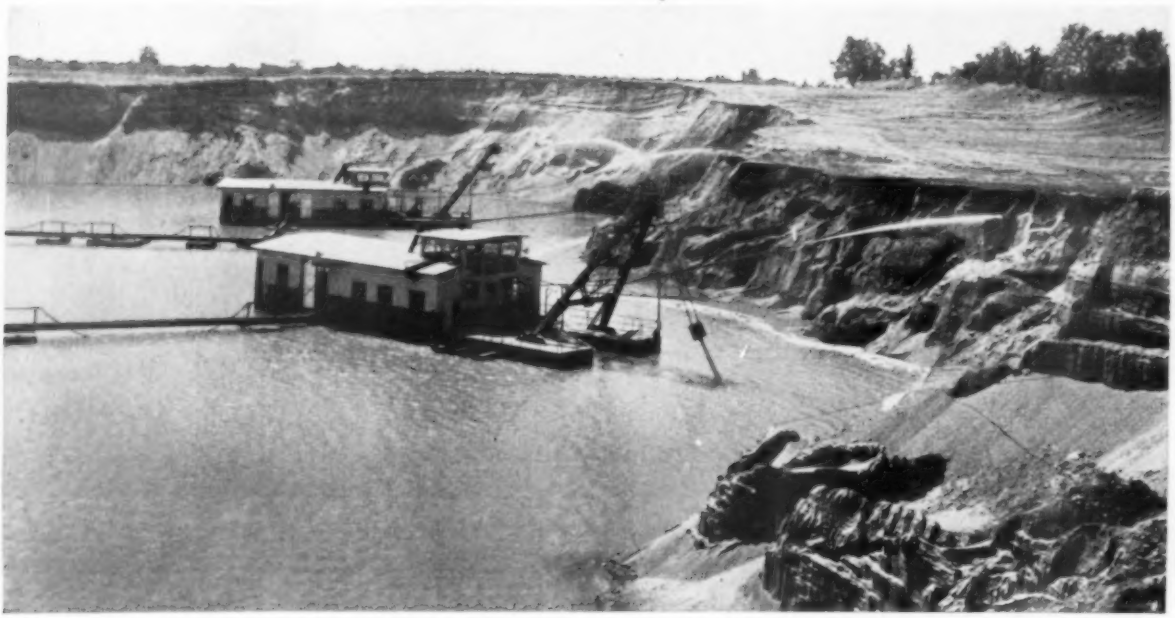
8C-8

ALLIS-CHALMERS *Engineering in Action*

Armco 20-inch-diameter Pipe discharges onto a desanding table.

THIS ARMCO PIPE CARRIES 1,000 TONS OF MATERIAL AN HOUR

Dredges with 20-inch-diameter Armco Pipe discharge lines handle 1,000 tons of material per hour at American Aggregates Corporation's Green Oak, Michigan, plant.



Dredging operation uses 20-inch-diameter Armco Pipe

American Aggregates Corporation, at its Green Oak, Michigan, plant, uses 20-inch-diameter Armco Special Analysis Steel Pipe to carry material from the large dredges to the desanding tables. The rate is 1,000 tons an hour. Annual production capacity of this plant exceeds 2,500,000 tons.

Ordinary pipe would quickly wear out under this high volume of flow. But Armco Special Analysis Steel Pipe stubbornly resists abrasion. In addition, Armco Pipe provides high resistance to pressures and impacts.

Armco Pipe can be supplied with machine-reduced or expanded ends. Pipe ends can also be flanged or prepared for special couplings or welding. Other special end finishes are available. Diameters range from 6 to 36 inches; wall thicknesses from $\frac{9}{64}$- to $\frac{1}{2}$-inch.

Use Armco Pipe to save time, trouble, and money in phosphate mining, dredging, slurry recovery, and similar operations. Write us for information applied to your specific needs. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3907 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

ARMCO SPECIAL ANALYSIS STEEL PIPE

for tough-screening jobs on construction sites, choose . . .

CF&I INDUSTRIAL SCREENS

Because they give you:

- **Maximum resistance to abrasion, vibration, fatigue**
- **Accurate screening**
- **Low downtime—long life . . . large tonnage output**

CF&I Industrial Screens can offer you all these advantages because they're made from specially selected steel that's crimped and woven extra tightly—to ensure high production even under the toughest operating conditions.

CF&I **SPACE SCREENS**
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City San Antonio • San Francisco • San Leandro • Seattle • Spokane • Wichita • **WICKWIRE SPENCER STEEL DIVISION**—Atlanta Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia • **CF&I OFFICES IN CANADA:** Montreal • Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

5102

NEW 1958 CHEVROLET TRUCKS WITH NEW HUSTLE! NEW MUSCLE! NEW STYLE!

Just look at all they offer that's new and better . . . and you'll see why these new Chevies are the fleetest, sturdiest, handsomest dollar-savers yet! Meet Chevrolet for '58!

NEW MEDIUM-DUTY VIKINGS

Hardy Vikings roll in with nine brand-new models, offering new cab-to-rear-axle dimensions for improved semi-trailer, dump, stake and van-type operations. Options available boost GVW ratings all the way to 21,000 lbs. And you get traditional Chevrolet economy in the industry's most popular 6's and in V8's packing up to 175 h.p.

NEW HEAVY-DUTY SPARTANS

The robust Spartans make hauling history with the revolutionary 230-h.p. Workmaster V8 with Wedge-Head design. The combustion chambers are located in the cylinder block rather than in the cylinder head. Here's maximum power, less wear than ever. It's featured on 90 and 100 Series trucks as are sturdy cast-spoke wheels and an 18,000-lb. rear axle. Look over Task-Force 58 at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET

SEE THE LATEST EDITIONS OF THE "BIG WHEEL" IN TRUCKS—1958 CHEVROLET TASK·FORCE TRUCKS

GENERAL

NYGEN® TIRES

ALL DUTY
L. C. M.

LOGGING
CONSTRUCTION
MINING

Moving Montana mountains in record time for Morrison-Knudsen on back-breaking Noxon Rapids Hydroelectric Project!

Daily, on construction, logging, mining and quarrying jobs from coast to coast, durable, dependable General Nygen Tires continue to amaze veteran fleet operators with their ability to cut costs and increase profits. Built tougher with Nygen Cord for the toughest jobs, General Nygen Tires can save you time and money starting today! Why not let them?

DUAL
TRACTION
LUG

EARTH
MOVER

H. C. T.
LOGGER

TRACTOR
GRADER

specify **GENERALS** *on new equipment*

THE GENERAL TRUCK TIRE

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

Bull's-eye performance means more cement and fewer upsets.

HOW TO CUT FUEL COSTS
of rotary kilns

1. Measure and record *oxygen* and *combustibles* in kiln exit gases. These factors directly affect fuel costs.

2. Reduce oxygen (excess air) until a trace of unburned fuel begins to show up in the exit gases.

3. Provide the burner with a reliable combustion guide—% *oxygen* and % *combustibles* on the same chart. Then a single glance shows the burner that he is holding maximum combustion efficiency.

To increase overall kiln efficiency let a Bailey Engineer help you plan for *bull's-eye* performance . . . or for additional information write for a BAILEY KILN CONTROL FOLDER. C-11

BAILEY METER COMPANY

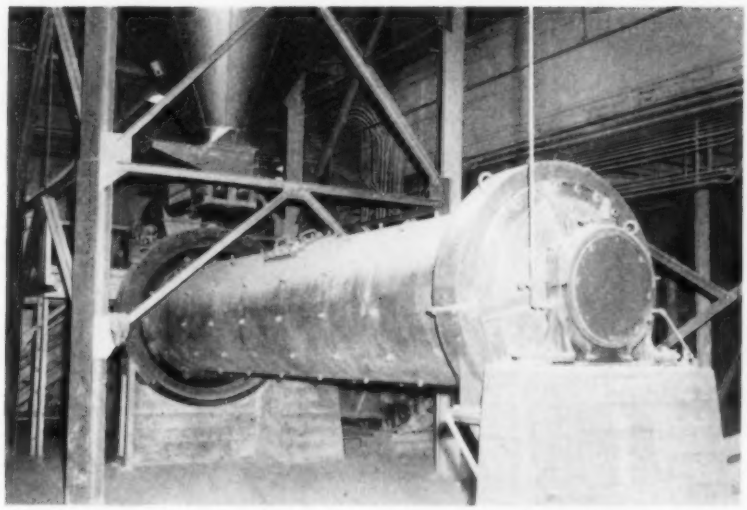
1051 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

BAILEY METERS

see what Marcy can do for YOU!

Custom-engineered Marcy Mills solve fine grinding problem for Kaiser Gypsum



Kaiser Gypsum Co., Inc., has wallboard and plaster manufacturing plants at Seattle, Washington; Antioch, California, and Long Beach, California. At all three plants Marcy Grate Discharge Ball-tube Mills operate 24 hours per day. These units include a 4½′ x 16′ mill at Seattle, two 4½′ x 20′ mills at Antioch, and 4½′ x 16′ and 4½′ x 20′ mills at Long Beach.

In manufacturing wallboard and plaster products, gypsum must be ground to an extremely fine product, to add plasticity to the end product and to control the aging of the plaster. Kaiser Gypsum solved this fine grinding problem by installing specially designed Marcy Grate Discharge Ball-tube Mills which include the additional feature of peripheral discharge.

High-temperature calcined gypsum is dry ground from approximately 100 mesh to a product between 2000 and 3000 Blaine. On occasions fineness of grind has been 5000 Blaine for special applications. This flexibility in fineness of grind, with most convenient means of control, is one of the important advantages derived from specialized Marcy engineering.

Solving this type of grinding problem is typical of Marcy engineering . . . you, too, can take advantage of this experience — just write, wire, or call.

NO EXTRA CHARGE FOR MARCY® EXPERIENCE

THE MINE AND SMELTER SUPPLY CO.

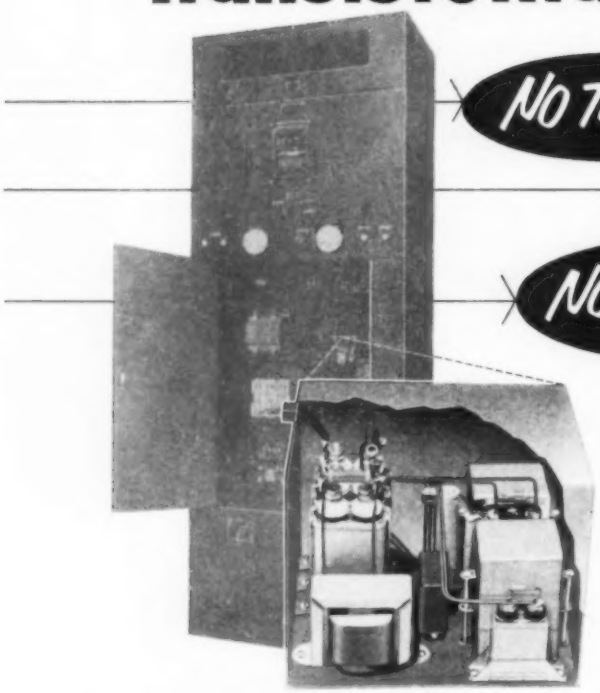
DENVER NEW YORK SALT LAKE CITY EL PASO

SALES AGENTS AND LICENSED MANUFACTURERS THROUGHOUT THE WORLD

BY FAR, the Industry's Most Advanced Precipitator Control...

THE WESTERN PRECIPITATION

"Transistomatic" CONTROL



No Tubes!

No Relays!

No Counters!

and carries a Lifetime Guarantee!

In the electrostatic precipitation of dust, fume and fly ash, no installation is completely modern without *automatic* control to maintain optimum Precipitator efficiency as the characteristics of the gas stream fluctuate. Compared with manual control, automatic control is not only more sensitive and more efficient, but actually costs less because of the vital savings it makes in labor and operating costs . . . *savings so important that no profit-minded operator will want to be without them.*

But the important point to remember is this—
Although many manufacturers of precipitation equipment offer units for precipitator automation, no other unit is equal to the "Transistomatic" Control for foolproof simplicity, rugged dependability or control accuracy!

These are not idle claims. They can be easily verified by making your own comparison . . .

A DESCRIPTIVE BOOKLET
that gives further facts and figures will gladly be sent on request. Write, wire or phone our nearest office!

Compare ACCURACY! The "Transistomatic" does not base its "sensing" action on spark *frequency* alone—or spark *intensity* alone. Instead, it continuously integrates BOTH frequency and intensity to establish an overall "power value" that provides a new standard of control accuracy!

Compare DEPENDABILITY! The "Transistomatic" unit contains no parts of any kind requiring regular replacement. Moreover, the entire unit is completely sealed—moisture-proof and watertight.

Compare GUARANTEES! The "Transistomatic" is so foolproof and trouble-free it carries a *lifetime guarantee!*

BEFORE YOU BUY ANY automatic precipitator control, be sure to get the complete "Transistomatic" story. A folder is available giving facts and figures. Or see your nearest Western Precipitation representative for further details!

WESTERN
PRECIPITATION
CORPORATION

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

Precipitation Company of Canada Ltd., Dominion Square Bldg., Montreal

Get cost-tumbling 4-machine utility in NEW mining TD-6 4-in-1

U. S. Bureau of Mines APPROVAL No. 2410

The components of this new International Drott underground mining tractor were safety-tested and approved at the Bureau of Mines Laboratory, Pittsburgh, Pa.

Yes, now you can have the exclusive 4-In-1 with four-machine utility in another New International Drott mining tractor: the new TD-6 with one cu. yd. capacity.

The versatile, big-capacity TD-6 meets rigid U. S. Bureau of Mines safety standards for non-coal mining. It features the new short-coupled, stainless steel scrubber—that cools exhaust to a maximum of 160°F, while efficiently dissolving irritating aldehydes with water-bath turbulence.

The new design also provides blower fan action on the final exhaust which breaks up noxious gas concentrations to a ratio of 40 parts fresh air to one part exhaust.

In addition, low, 5-foot "trolley-clearing" profile, and "lean-over" features of the compact new TD-6 provide unmatched, full-load "mine-tunnel" maneuverability.

Prove the tremendous cost-cutting, profit-producing advantages by getting big-capacity four-machine utility for one moderate investment—instantly, at the touch of a hydraulic machine-selector lever! See your International Drott Distributor for a demonstration of the new TD-6—or 1½ cu. yd. TD-9—mining tractor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Ever wish you could pull a dozer "out of your hard-hat"...

to quickly shove material aside or pile it? Well, it's just that simple with an International Drott 4-In-1!

Ever wish you could have a clamshell by "a twist of the wrist"...

to have a bucket with "stand-and-fill" action to work under low ceilings and in close quarters? Well, it only takes a flip of the lever to start earning money with the 4-In-1's clamshell!

Ever wish you could take a "carry-type scraper" underground...

one that can strip, grade, or spread with inch-close accuracy—and can "skin-off" layered materials like nothing else on tracks? Well, you can! Famous 4-In-1 gives you this action, too!

Ever dream you could command "rock-busting" Skid-Shovel action...

from a mobile, sure-treading crawler loader—and get three other machine actions, to boot? Well, you can in a 4-In-1—for Skid-Shovel action, with exclusive pry-action break-out, is integral in 4-In-1 design!

Sauerman News Briefs

SPECIAL EDITION OF SAUERMAN NEWS

Brief items about the Sauerman Method... Crescent DragScrapers Slackline and Tautline Cableways... Durolite Blocks

Sauerman Bros., Inc. • 634 South 28th Avenue • Bellwood, Illinois, (Chicago Suburb)

4-YARD DRAGSCRAPER ELIMINATES A SHIFT AND UPS PRODUCTION

At the Union Sand and Gravel Co., a Sauerman DragScraper Machine gives Union the production necessary to supply increased plant demand in just one shift. Two shifts were required with their previous installation when a smaller Crescent and hoist were used.

The 4-yd. DragScraper delivers 175-cu. yds. or about 250 tph. when digging 400 ft. from the hopper. Power is supplied by a Sauerman three-drum hoist which has an inhaul speed of 500 fpm. with loaded bucket and a 1,000 fpm. backhaul speed. A 30-ft. tubular steel mast equipped with Durolite blocks forms the head end assembly. Operating cables from the hoist are reeved through the head end Durolites to the rapid-shifting tail bridle system 500 feet away.

A trolley and tail block travel the tail bridle cable. Lateral shifting of the trolley by the third drum changes the Crescent DragScraper's line of operation.

(Condensed from Sauerman News No. 144.)

How MAPCO Digs and Hauls at a Cost of 4 Cents per Ton

Mapco Sand and Gravel Co. is using a 2-yd. DragScraper to work their deposit at a cost of about 4 cents per ton. The company bases this figure on production of 235,000 tons and includes all labor, power, cable replacement and maintenance of hoist and blocks.

The DragScraper Machine is equipped with an electrically operated skid-mounted Sauerman hoist. Power is transmitted by V-belts. This new hoist replaced another Sauerman hoist that was in service for over 25 years.

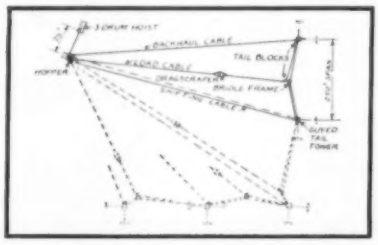
The Crescent DragScraper works the pit and bank face and delivers to a ground level hopper on an average haul of 450 ft.

(Condensed from Sauerman News No. 148.)

DragScraper Supplies Gravel for 82 Miles of Turnpike

More aggregate production was needed by Southern Michigan Materials, Inc. to supply structural and, upon completion, the maintenance and incidental needs for 82 consecutive miles of the Ohio and Indiana Turnpikes.

This demand was met with a new plant and a 5-yd. DragScraper which supplies gravel at the rate of about 275 tph. Digging goes to a depth of 75 to 80 ft. Power is provided by a Sauerman three-drum hoist driven by a 325-hp. diesel. The rapid-shifting bridle provides a means of changing the DragScraper's line of operation by placing the tail block attached to the bridle in another position along the 250-ft. span between the two steel tail towers.

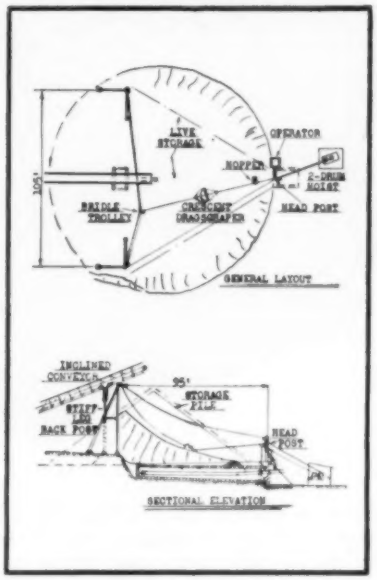


The hoist is pneumatically controlled by the operator from the hoist house. His location gives him excellent visibility of the entire pit and most of the plant.

The parent company, Northwest Materials, Inc., has completely excavated another pit nearby with a Sauerman 2-yd. Slackline Cableway. Northwest also uses a small scraper for stockpiling and reclaiming material from storage.

(Condensed from Sauerman News No. 145.)

Rapid Shifting DragScraper is Engineered to Needs of Silica Sand Producer



The Sauerman Method was successfully applied to the requirements of a prominent silica sand producer, as shown in the drawing above. This Rapid-Shifting DragScraper Machine reclaims raw sand from a 6,000-ton stockpile.

The pile is formed by an inclined conveyor leading from the floor of the quarry to the live storage area. The Crescent DragScraper reclaims from storage to a hopper-fed conveyor in front of the head post.

Before the DragScraper was installed, the raw sand frequently bridged across the hopper. Such interruptions in the flow of raw sand to the plant resulted in costly shutdowns. The Crescent prevents this bridging action and provides a steady flow of material for processing.

The Sauerman Method also permits the company to build up a reserve pile of raw sand sufficient for at least one week's production as insurance against a quarry shutdown.

(Condensed from Sauerman News No. 147.)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 634 S. 28th Ave., Bellwood, Ill.

AN IMPORTANT ANNOUNCEMENT

TO USERS OF EXPLOSIVES

American Cyanamid Explosives Now Serve You Nationwide and Market-Wide!

In a move to extend and broaden the range of our services to explosives users, American Cyanamid Company has purchased the plants, magazines and sales facilities of Illinois Powder Manufacturing Company.

Because of these expanded facilities, it is now possible for Cyanamid to serve you better...faster...with a wider range of dependable, *quality* explosives, electric blasting caps and blasting accessories.

Our sales representatives will welcome the opportunity to analyze and discuss your blasting problems.

CYANAMID

AMERICAN CYANAMID COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

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Bessemer, Alabama
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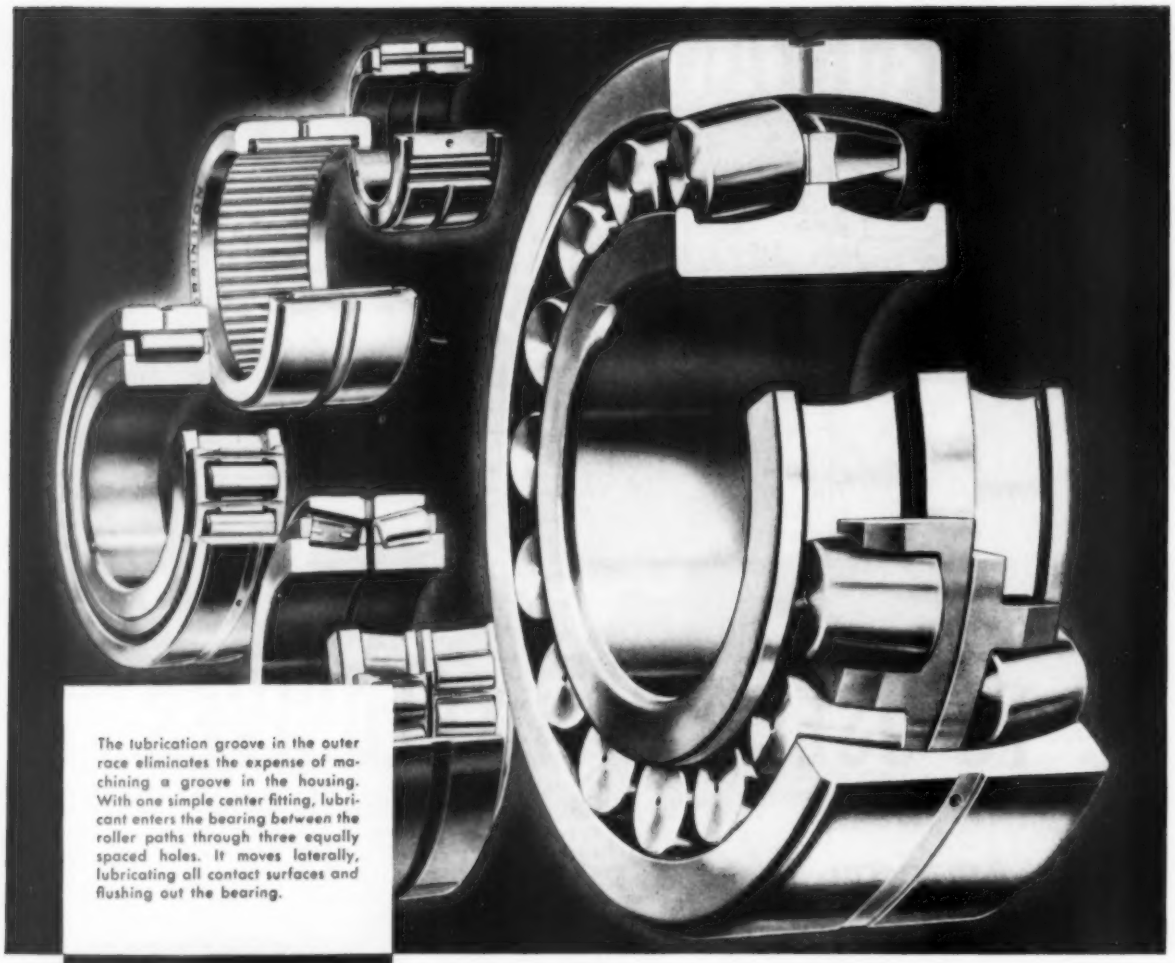
ROAD CONSTRUCTION

QUARRYING

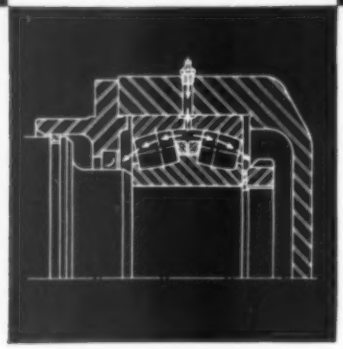
METAL MINING

COAL

OIL EXPLORATIONS



The lubrication groove in the outer race eliminates the expense of machining a groove in the housing. With one simple center fitting, lubricant enters the bearing *between* the roller paths through three equally spaced holes. It moves laterally, lubricating all contact surfaces and flushing out the bearing.



A time-proved lubricating method now available on Torrington Spherical Roller Bearings

The circumferential groove in the outer race has met the test of experience in many Torrington Bearings, including Heavy Duty Needle Bearings, Aircraft Type Needle Bearings, Tapered and Radial Roller Bearings. Now the circumferential lubrication groove is available in Torrington Spherical Roller Bearings.

This design feature makes it possible to introduce lubricant *between* the roller paths without the expense of machining a groove in the housing. This groove is proportioned to provide generous lubricant flow capacity. Lubricant moves through the roller paths, flushing used lubricant and contaminants away from bearing contact surfaces.

Torrington Spherical Roller Bearings in many sizes may be ordered with this groove as desired at no additional cost. For further information, see your Torrington representative or write: **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

How B&W Standardized Universal Liner Plates Speed Mill Installations

Uniform Castings Fit All Mill Sizes

B&W Universal Liner Plates save manhours and reduce mill downtime because they are quick and easy to install. Since the same casting fits all mill sizes, B&W standardization also means lower costs, higher performance, longer life and less breakage in your operations.

Here is the simplified installation procedure:

1. Lay liners in bottom half of the mill with the desired lifter centers.
2. Then, place in position a simple installation form and complete the ring of liners without turning the mill. The last casting in each ring is wedged tightly into place by means of a hydraulic ram and locked with a pin. The joints are designed to permit the use of a spacer pin where needed. The number of pins in a ring depend upon shell variations and lifter centers used.

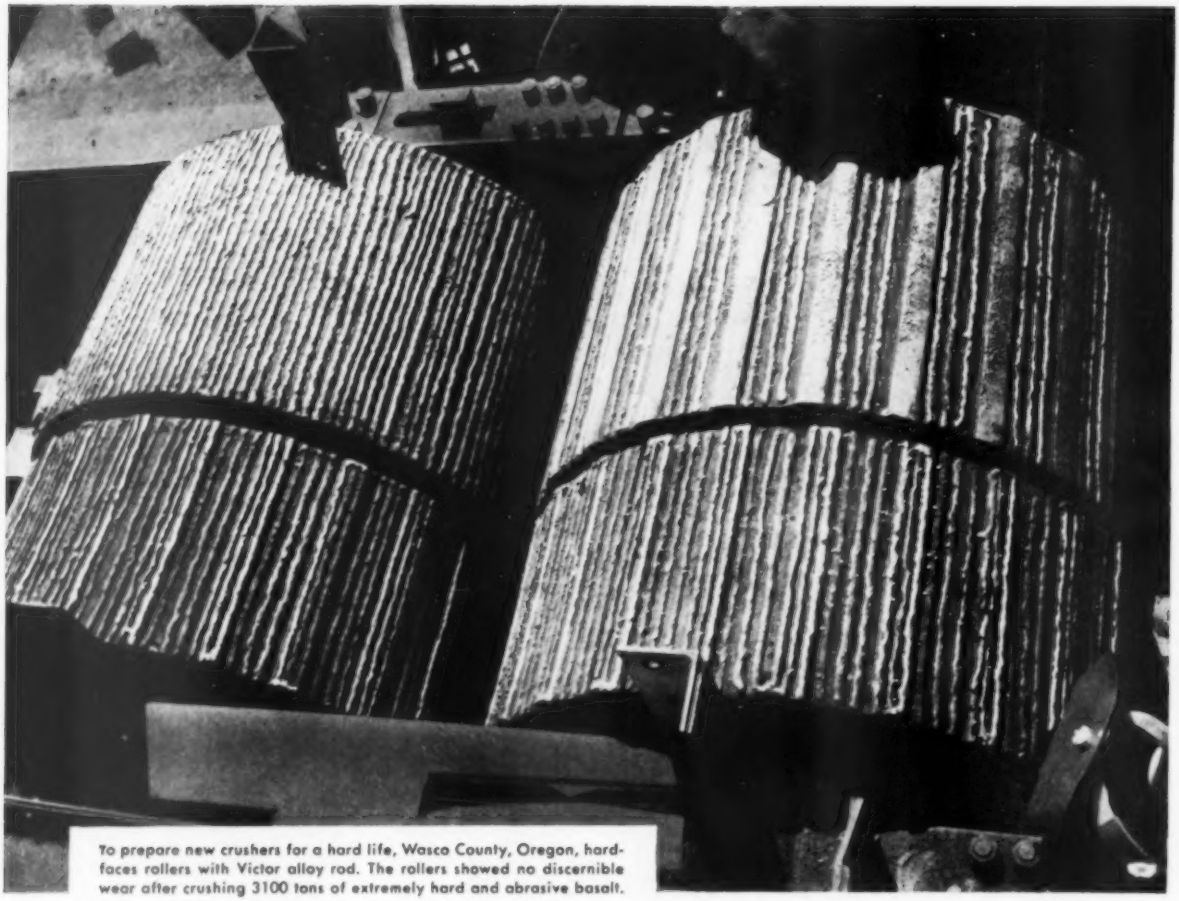
With B&W Universal Liner Plates, direct labor cost and installation downtime are reduced. Small, lightweight castings are easily handled, minimizing worker fatigue and eliminating the necessity for cranes. Also, B&W Universal Liner Plates give longer life of greater usefulness. Uniform wear results from better quality control on a mass production casting with permanent molds. You save money on liner inventory, breakage claims and delays for replacements. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. Costs are also reduced for storage space since small castings stack easily.

Liners are supplied in two nominal thicknesses, 1½″ and 3″ with 1½″ high lifters. Castings are 6″ wide x 12″ long. For additional information on B&W Universal Liner Plates, write The Babcock&Wilcox Company, Process Equipment Dept., Barberton, Ohio.

S-472

BABCOCK & WILCOX

BOILER DIVISION



To prepare new crushers for a hard life, Wasco County, Oregon, hardfaces rollers with Victor alloy rod. The rollers showed no discernible wear after crushing 3100 tons of extremely hard and abrasive basalt.

Lifesaver for new or used equipment **VICTOR Hardfacing Alloys**

Wasco County, Oregon, uses lots of crushed basalt. This rock crushes readily, yet is extremely hard and highly abrasive, consequently tough on rollers. So, as standard practice, Supt. Wayne Weeks hardfaces all rollers in brand new crushers, before ever they crush a single basalt rock. He reports hardfacing of new equipment prevents excessive wear of surface material, thus maintaining roller size during the work hardening period.

On this new crusher, he used 200 lbs. of Victor #0 semi-automatic wire, size 7/64", to hardface roller faces, and 50 lbs. of tube Victorite coated for finish work around the roller edges. Longer crushing life will quickly pay for the rod.

You, too, can save money and extend the life of equipment subjected to abrasion, impact and heat. Simply make it standard practice to hardface both new and worn equipment with Victor alloy rods. Complete line of 27 different hardfacing rods assures you a right rod for every hardfacing need. Full range of sizes for both acetylene and electric AC and DC applications, either hand, automatic or semi-automatic. Order a supply from your Victor dealer TODAY.

FREE Victor Hardfacing Manual shows you right rod to use and how to apply it. Write us NOW for your copy.

VICTOR for welding

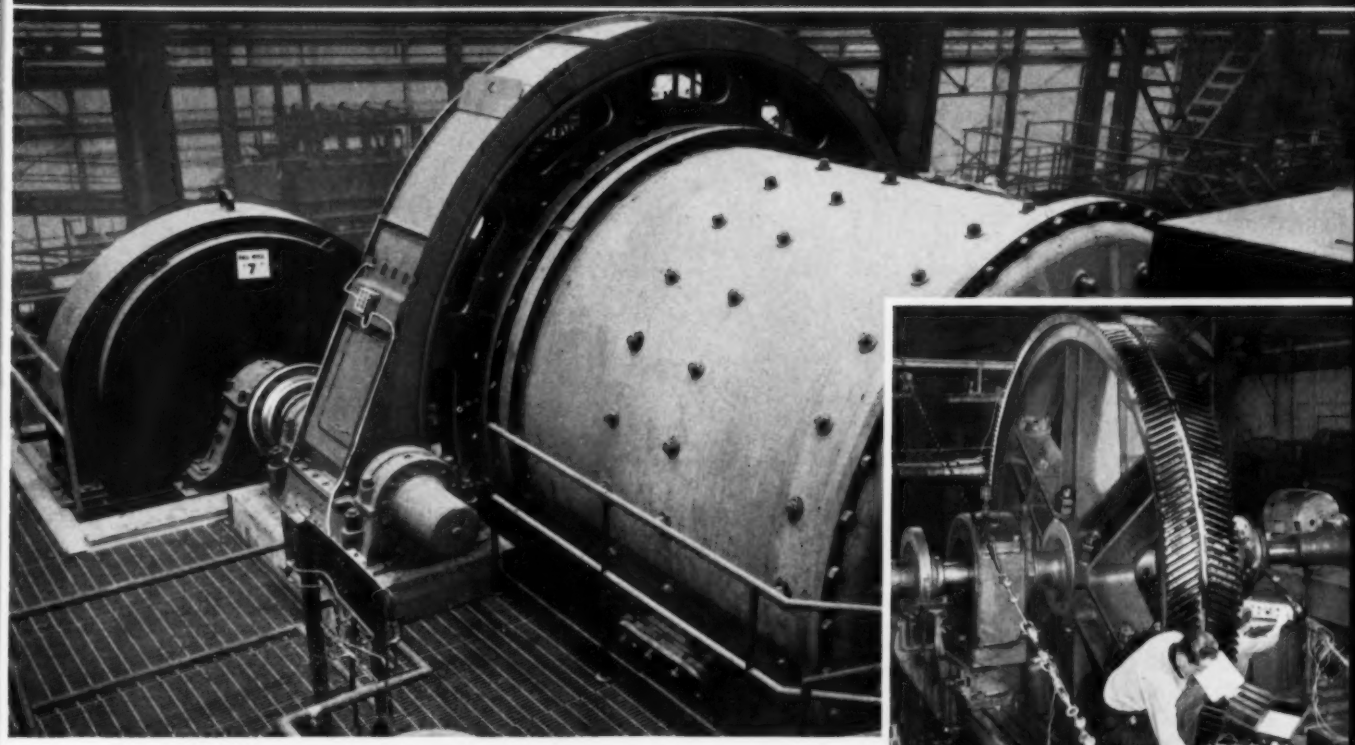
Profitable dealerships open; inquire now!

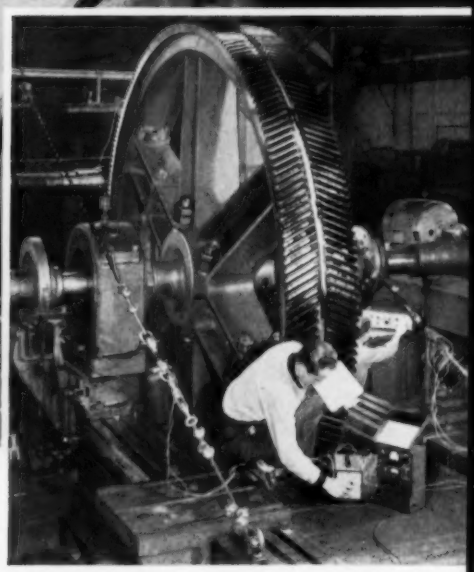
VICTOR EQUIPMENT COMPANY 42

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

HELICAL GEARING BY **FALK** ...FOR MILLS AND KILNS





Falk Gears are *the Most Efficient* you can buy...

and are the most economical in the long run!

These are broad claims—but they have been proved beyond question by countless laboratory tests and confirmed by the actual experience of leading mill and kiln operators and engineers.

Falk ring gears transfer the gear tooth load directly to the shell flange of mill or kiln. They are correctly designed and of rugged proportions for maximum rigidity and accuracy. These helical gears—with extra-depth, extra-capacity teeth—provide a single-mesh, high reduction ratio drive giving you these advantages:

- Gear efficiency of 98+% (see column at right)
- High motor speeds—hence saving in motor and power costs
- Smooth helical gear action
- Maximum resistance against abrasive wear
- Longer service life of gears and of driving and driven machinery

This all adds up to the highest efficiency and greatest over-all economy. Don't compromise with quality on your gearing. *Insist upon Helical Gears by FALK*—the country's pioneer and leading supplier of precision gearing.

Consult any Falk representative—also, write for **Engineering Report 6170**, "Advantages of Helical Gearing."

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 1, WISCONSIN

GEAR EFFICIENCY PROVED BY SPECIAL LABORATORY TESTS

In the Falk Mechanical Test Laboratory, continual full-load tests of helical gears and gear units are conducted to provide accurate data on gear efficiency. Load efficiency, speed, lubrication and capacity tests are made.

The above photo shows the use of special testing equipment to obtain data on mechanical efficiencies of Falk helical gears. Tooth pressures corresponding to rated capacity and speed are applied through a loading device equipped with strain gages for accurate load measurement. Power losses are determined by an accurately calibrated torque meter on the connecting shaft of the motor.

Test data show the average tooth-mesh loss for a single-reduction set of Falk Helical Gears is *less than* 1½% of the rated capacity. Thus, the efficiency of the gears is 98½% *or greater*—proof that Falk Helical Gearing is the most efficient obtainable.

FALK

...a good name in industry

HENDRIX

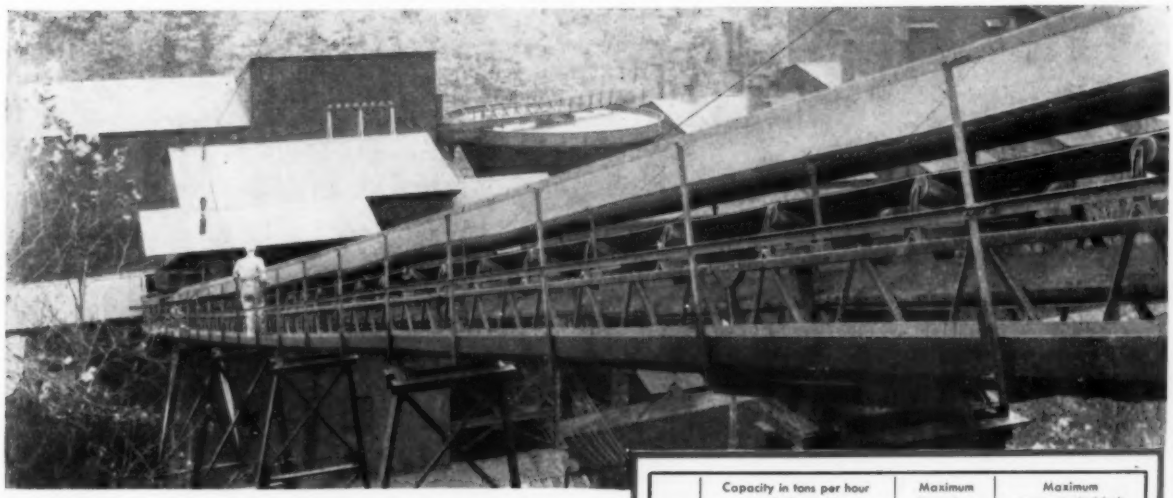
DRAGLINE BUCKETS

On any digging operation Hendrix Dragline Buckets move *bigger* loads *faster*. A full bucket every cycle results in more material moved . . . in less time . . . for the lowest "cost-per-yard."

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

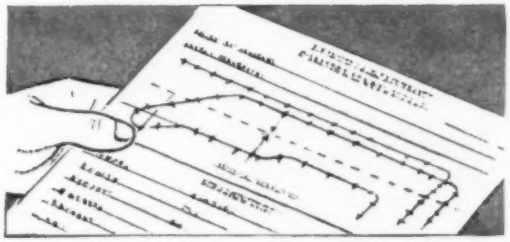


For lower costs down the line
make your belt conveyors

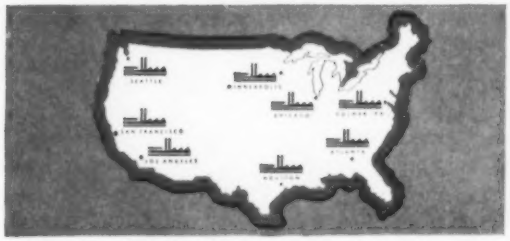
PRE-BILT by LINK-BELT

Belt width, inches	Capacity in tons per hour at belt speed of 100 FPM			Maximum lump size, inches		Maximum recommended belt speed, FPM	
	Weight of material, lbs. per cu.ft.			Sized	Unsized	Half maximum size lumps	Maximum size lumps
	50	75	100				
18	27	40.5	54	3	5	400	300
24	50	75.0	100	4½	8	500	400
30	81	121.5	162	7	10	600	450
36	117	176.0	235	8	14	650	500

EASY SELECTION. Your Link-Belt engineer will help you choose the best combination from a wide selection of PRE-BILT sectional belt conveyor components.



PROMPT ESTIMATES. From standardized data, an "on-the-site" quotation can be prepared covering the components for your needs.



SPEEDY DELIVERY. Standardized parts are shipped from the nearest of 8 plants. One-source availability eliminates the delay of coordinating purchases from several suppliers.

FAST INSTALLATION. Due to simple construction and shop-assembled components, you can do your own erecting. Link-Belt also furnishes complete erection service and supervision.

Link-Belt PRE-BILT sectional belt conveyors combine operating efficiency and economy to give you years of dependable, profitable operation.

For full information on these durable conveyors up to 36 in. wide—with drives up to 40 hp, 24 and 42-inch truss depths—contact your nearby Link-Belt office, or send for Book 2579.

LINK-BELT

14,702

BELT CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

JAEGER "600" ROTARY easily powers dual 4" drill rig in 18' limestone ledge at Nelson Brothers quarry, Lathrop, Kansas. Compressor maintains plenty of reserve power behind the drills at characteristic slow, economical operating speeds.

How Jaeger air cuts drilling cost

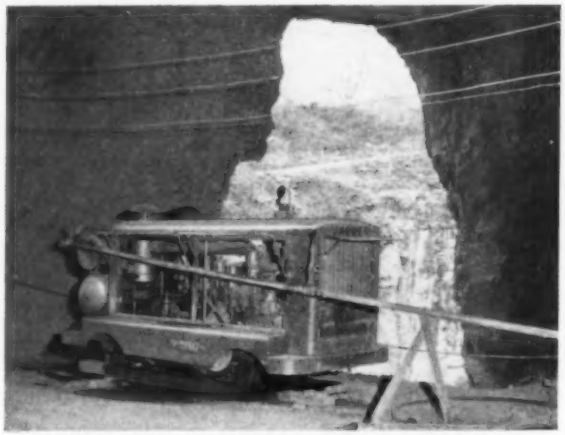
Same mobile "600" saves money in quarry and on 450,000-ton excavation for Turnpike

With its Model 6-71 GM diesel engine easing along at fuel-saving speeds that never reach 1650 rpm, this truck-mounted Jaeger "600" rotary compressor powers two 4" drills at top production efficiency in limestone quarry supplying concrete and road aggregates.

Over long hours of steady drilling, the slow-speed, efficient operation of the Jaeger "600" (1650 rpm full load speed instead of 1750-1800) means substantial savings in fuel and engine and compressor wear. These savings were repeated when Nelson Brothers, the owners, shifted their mobile rig to a 450,000-ton rock excavation project for the Kansas Turnpike.

Slow-running, efficient performance, resulting in fuel economy, fewer fpm of engine piston travel and thousands fewer compressor revolutions per hour, is characteristic of all Jaeger rotaries. Smaller units (125, 250 and 365 cfm) deliver full volume at 1700 rpm versus 1800 to 1950 rpm in similar compressors having no more than equal, and often less, air capacity.

It will pay you to make your next compressor a Jaeger. Call or visit your Jaeger distributor for full details and prices, or write us for Catalog JCR-5.



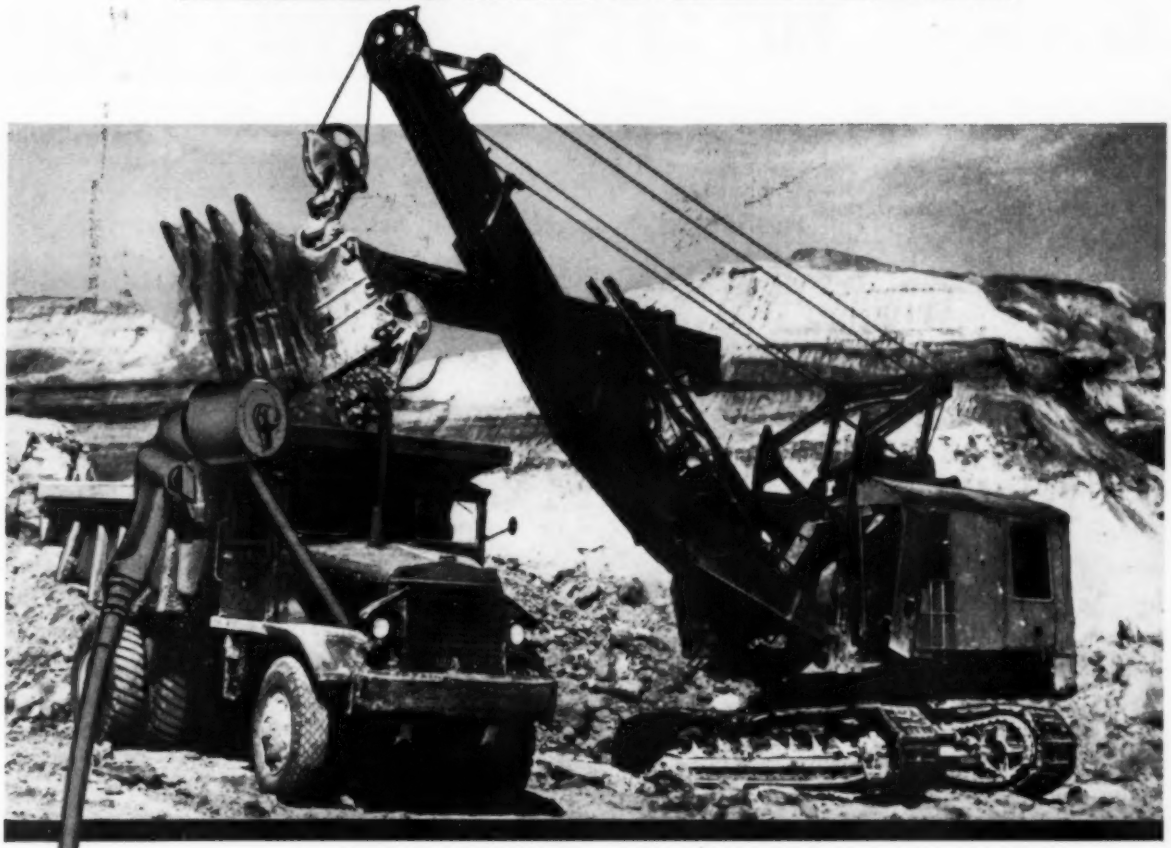
LOGS 400' (IN 12'-18' DEPTHS) PER 8-HOUR SHIFT, IN HARD MISSOURI LIMESTONE: Using only 36 gallons of fuel per 8 hours, Jaeger "600" powers two 4" drifters to this average daily production in Federal Materials Company underground quarry, Cape Girardeau, Mo. Jaeger slow-speed, high efficiency performance saves fuel and wear on every job.

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

Two-fisted for tough going!



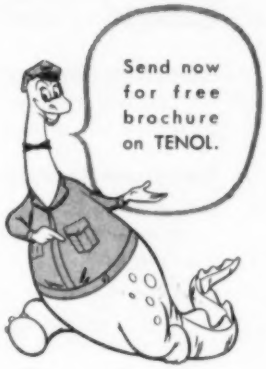
Your Diesel engines run better, last longer when you change to Sinclair Super TENOL® Motor Oil.

Sinclair Super TENOL safeguards your equipment against the damaging effects of high temperature and continuous stop-and-go operation.

Sinclair Super TENOL withstands such punishing conditions because it's specially made for tough going. High viscosity index base oils, combined with an exclusive formula of selected additives, give your Diesel the greatest protection against varnish, sludge, rust and acid corrosion.

Refill now with Sinclair Super TENOL Motor Oil. Contact your local Sinclair Representative for further information, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

Dino, the Sinclair Dinosaur, says:



SINCLAIR SUPER TENOL

Maybe you're paying

for top quality "Commercial Grade" Roller Bearings...BUT ARE YOU GETTING THEM?

Cutaway view of Rollway Tru-Rol® segmented-retainer roller bearing . . . one of three distinct types of Tru-Rol bearings available.

True, there's a wide difference in quality and cost between the low-range and high-range of any "commercial grade" bearing. But every Rollway Tru-Rol "commercial grade" bearing approximates as closely as possible maximum standards of construction consistent with the price.

Take the matter of separators, for example: In Rollway bearings, separators give maximum guidance to each roller. The result is greater total load capacity and longer life.

Equal spacing of rollers means uniform distribution of load. The result is the elimination of destructive "pulse" and vibration.

Moreover, separators are of deep section, formed to the curve of the rollers, giving true axial alignment, smooth-surface contact and an even lubrication film on each roller.

It's little things like these that mount up to big savings in service. Check the accompanying list, or ask a nearby Rollway Service Engineer to explain in detail the quality you should be getting in your "commercial grade" bearings. No cost. No obligation. Just write us. Rollway Bearing Co., Inc., 586 Seymour St., Syracuse, N. Y., *manufacturers of a complete line of radial and thrust cylindrical roller bearings.*

ENGINEERING OFFICES: SYRACUSE • BOSTON • CHICAGO • DETROIT • TORONTO • PITTSBURGH • CLEVELAND • MILWAUKEE • SEATTLE • HOUSTON • PHILADELPHIA • LOS ANGELES • SAN FRANCISCO

Check This List AND BE SURE!

Retainer Operation

☐ Is the retainer roller-supported, to reduce sliding friction?

Retainer Construction

☐ Is the retainer strong enough to withstand shock loads and sudden reversals?

(A Rollway segmented-type steel retainer, such as that illustrated, is the strongest, most durable available in commercial grade bearings.)

Roller Spacing

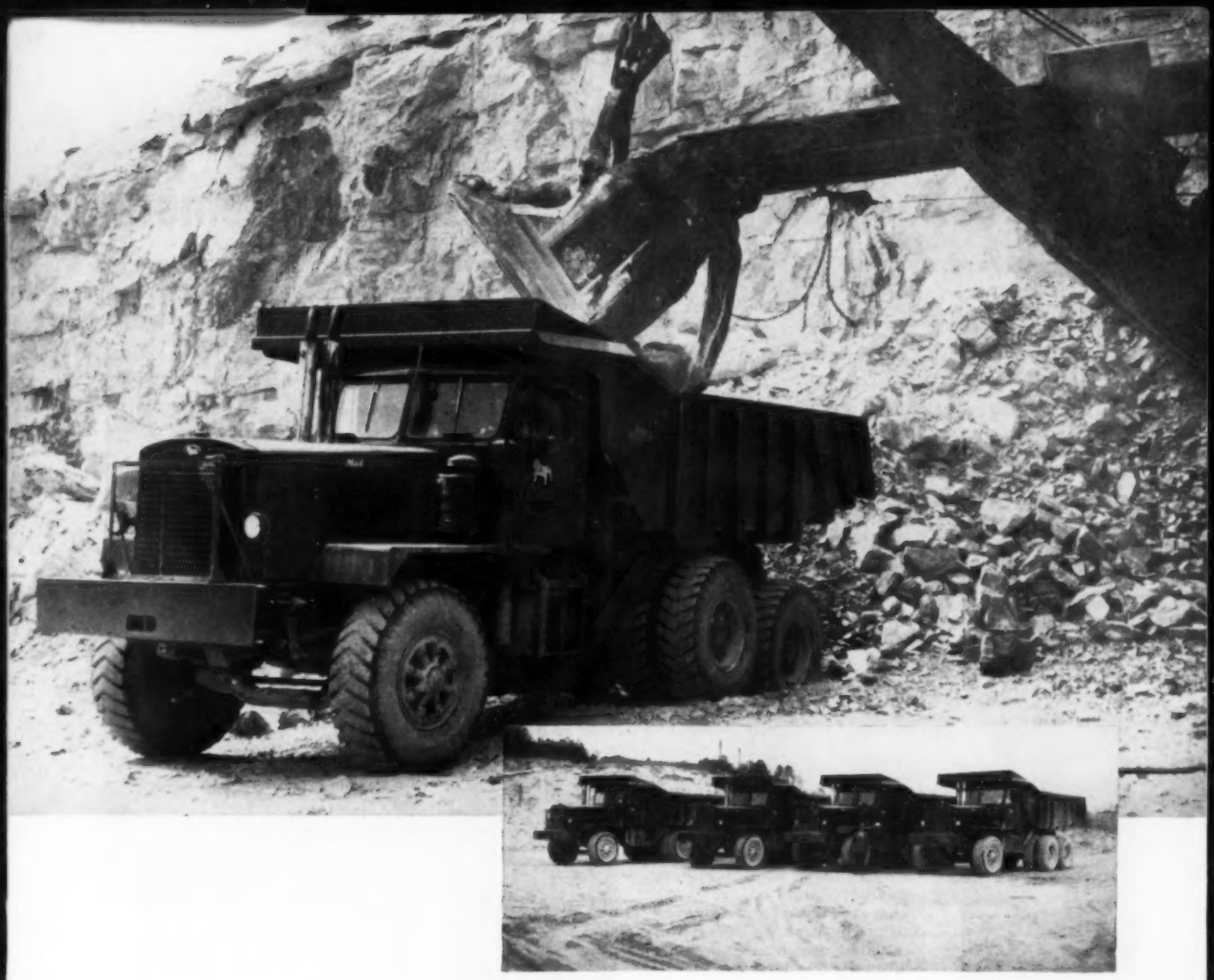
☐ Are all rollers equally separated, or do some rub against each other in opposed-motion friction?

☐ Are rollers distributed evenly to prevent "pulse" and vibration?

Roller Construction

☐ Are the rollers crowned for optimum load distribution?

For Top Quality in Every Detail Buy Tru-Rol and Be Sure!



Stockbridge replaces 8 trucks with 4 Macks

"We recently put four large-capacity Mack dumpers to work on a job that had required the full-time efforts of eight smaller trucks of competitive make. First result—four fewer drivers. Then—because of their capacity and agility—these big Mack LRVSW's spent less time spotting under the shovels and dumping at the crusher. Also, we have far fewer maintenance problems because Macks stand up better under the harsh working conditions," says Mr. Ray Lambert, vice president in charge of the Stockbridge Stone Company's Georgia operation.

"We are using 4½-yard electric shovels, and six to seven passes make an average load of about 34 tons. Our Macks easily shoulder these big payloads up the 12% grade from the quarry to the crusher, with the torque converter eliminating much of the shifting and absorbing most of the shock on the drive line. And with Mack's Balanced Bogie with Power Divider, our drivers have no worries about getting bogged down.

"To sum up our experience with Macks, we've found that you can't beat 'em for profit-making quality!"

Macks help to make a more profitable operation for Stockbridge. They will for you, too, whether your operation is quarrying or mining. Your nearest Mack representative will be glad to illustrate with on-the-job reports that prove the performance and durability of Macks. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

Tru-Stop Brakes

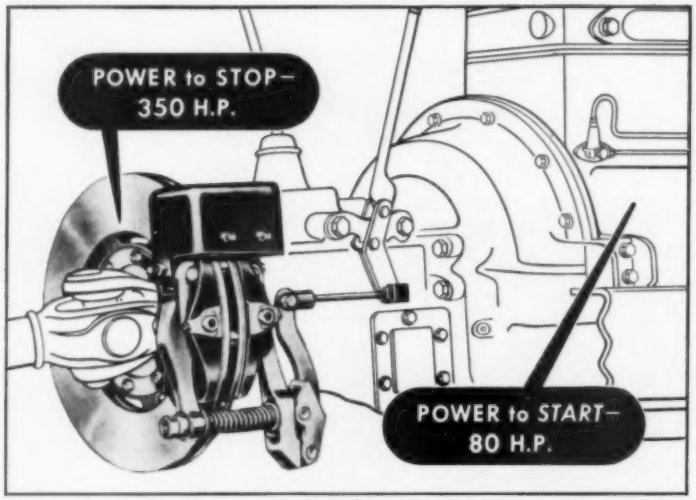
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

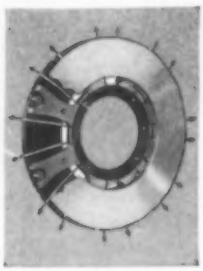
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

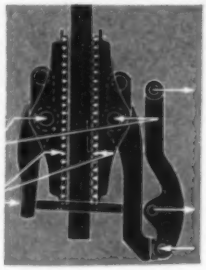


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat —rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

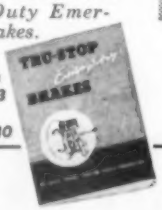
FOR SAFE, ECONOMICAL, HEAVY-DUTY BRAKING WITH MAXIMUM LIFE AND MINIMUM MAINTENANCE

TRU-STOP Brakes are used on a great variety of mobile and stationary equipment

SUCH AS—

- Motor cranes
- Road rollers
- Dump trucks
- Power dividers
- Cooling tower fans
- Oil well pumps
- Cold header presses
- Scrubbing machines
- Wire rope stranders
- Fork lift trucks
- Motor scrapers
- Tractors
- Graders
- Diamond core drills
- Electric locomotives
- Oil well servicing rigs
- Railway inspection cars
- Shapers
- Power take-offs
- Winches
- Motor shovels
- Tractor loaders
- Conveyors
- Hard rock drill positioners
- Mine locomotives
- Power presses
- Railway power ballisters
- Cable tool spudders
- Aerial tram cars
- Tension wire stringers

We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for Catalogs DH-33 and DH-530



Automotive and Aircraft Division
AMERICAN CHAIN & CABLE

601 Stephenson Building, Detroit 2
2216 S. Garfield Street, Los Angeles 22 • Bridgeport 2, Conn.

ACCO
TRADE MARK

One of the Heston fleet—an International L-190 with RD-406 engine, equipped with a 5-speed Fuller 5-A-62 Transmission.

FULLER Transmissions help keep mixers rolling on Heston's roughest jobs

"We are well satisfied with our 5-speed Fuller Transmissions. They see some rough service out on the job sites, and they're plenty rugged. Dependability like that is important to us, because concrete has to be delivered strictly on schedule," says Earl Geiss, Equipment Superintendent of Heston Concrete Corp., Indianapolis.

All 25 Heston trucks are equipped with the original 5-speed 5-A-62 Fuller Transmissions working behind RD-406 engines. Fuller Transmissions "put the power through" to deliver ready-mix concrete to the pour site even in the toughest sticky mud or sand off-road areas.

This satisfying performance can be yours, when you equip your trucks with Fuller Transmissions. From over 110 models available for rubber-tired equipment, you will find a Fuller Transmission designed to do *your* job better at less cost.

FULLER

TRANSMISSIONS

FULLER MANUFACTURING COMPANY, Transmission Division, Kalamazoo, Mich.

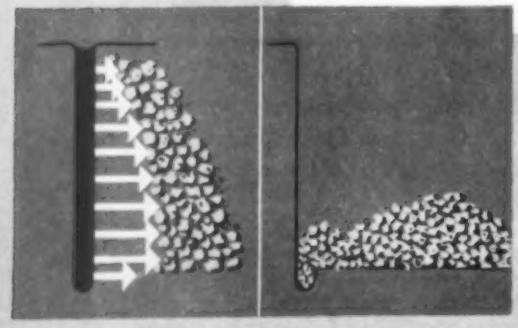
Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

HERE'S A NEWS BULLETIN

▲ *This technical bulletin contains information that can help you get quieter, more efficient blasts.*

◀ *Every issue contains discussions on important blasting problems by D. M. McFarland, manager of the Technical Customer Service Section.*

▼ *New, improved blasting procedures are graphically explained. New materials are reviewed and evaluated.*



To keep users of explosives posted on the latest in blasting developments

You'll be up on new explosives products and blasting techniques that can give you more efficient, economical results when you become a regular reader of "*Better Blasting*."

"*Better Blasting*" is published as a technical service by Atlas Powder Company. Each quarterly issue contains important safety information and such features as loading procedures that pay off in better shots . . . methods that minimize noise and vibration, and assure improved public relations.

You'll especially look forward to "Mac's Notes," an interesting column by Dave McFarland, often called "the father of millisecond delay blasting."

Start "*Better Blasting*" coming your way—free of cost or obligation. Write Atlas to put your name on the mailing list.

Ask also about the new Atlas safety movie, "*How to Handle Women and Explosives*" . . . or the public relations film, "*We're Blasting Near You*," which you can show to your neighbors to illustrate your efforts to minimize disturbance.

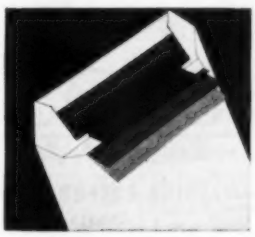
EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

Since Edgar Hoppe, European Manager of St. Regis, invented the Stepped-End Bag, the U. S. cement industry has bought more than 200,000,000 of them from St. Regis. Here are two big reasons why.

BREAKAGE IS LESS: Bag breakage has been sharply reduced in the cement industry, where St. Regis Stepped-End Bags are used. Cement companies report in-plant breakage reduced by as much as 50%.

IMPROVED APPEARANCE, STACKING, HANDLING: Your product is often judged by its container. The square-shaped St. Regis bags look better . . . and the butt printing makes for easy identification of the product. Smooth ends makes for neater stacking and handling, too. Just ask the users—they're some of the leading cement manufacturers in the nation.

Always looking toward tomorrow, St. Regis is working constantly to improve the Stepped-End Bag. New developments, through testing and re-testing in laboratory and field, combine to bring you top performance at minimum cost. Find out for yourself how St. Regis Stepped-End Bags can become an important part of your packaging picture. Mail the coupon today.



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Multiwall Packaging Division

St. Regis PAPER COMPANY

150 EAST 42ND STREET, NEW YORK 17, N. Y.

Please send me more information about the St. Regis Stepped-End Bag.

NAME..... TITLE.....

FIRM.....

ADDRESS.....

CITY..... STATE.....

FOR BIG POWER use Maxi-Power

PARALLEL SHAFT HELICAL GEAR DRIVES

1. Heavy duty, reinforced design housing for permanent alignment, rigid shaft support.
2. One mesh per reduction—fewer moving parts.
3. Broad faced helical gearing—high quality, accurately hobbed for greater strength, durability. Uniform tooth deflection under load . . . no uneven wear.
4. Shafts firmly held in place. Positive gear location assures full tooth engagement across entire face.
5. Smooth, overlapping mesh, close backlash tolerances, no oil trap, provide quiet operation, less heat generation.
6. Heavy duty, anti-friction bearings. Conservatively rated for wide range of operation.

Capacities to 1550 H.P.

★ **Single, Double, Triple Reductions**

★ **Standard Ratios from 2.08 to 1 up to 360 to 1**

★ **9 Shaft Arrangements**

There's more capacity, greater stamina and longer service life built into Foote Bros. Maxi-Power Parallel Shaft Drives. Simple, balanced design, fewer moving parts, heavy duty construction, efficient lubrication and conservative ratings make Maxi-Power drives the logical choice for critical applications and severest operating conditions.

You can depend on Maxi-Power Drives to produce maximum performance with minimum attention because they're built for just that kind of service.

Write for Engineering Manual MPB—has complete details and selection data. There's no obligation.

this trademark stands for the finest industrial gearing made

FOOTE BROS. Quil-Rated LIFETIME BEARING

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FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION

4571 South Western Boulevard Chicago 9, Illinois

Manufacturers' News

(*From page* 166)

Moving Mountains, a 27-minute, 16-mm. color and sound film available from the Clark Equipment Company, portrays man's efforts through the centuries to improve and speed his ability to move goods and materials.

The film tells the story of man's hard physical labors through the centuries to the present, when the development of mobile machines to handle products and materials more efficiently has made possible a shorter, easier day and more rewarding pay scales for all working people.

Produced by Pilot Productions, Inc., *Moving Mountains* may be obtained without charge by writing to the Community and Industrial Relations Department, Clark Equipment Company, Buchanan, Mich.

The floating dredge business of the American Steel Dredge Division of the American Hoist & Derrick Company, Ft. Wayne, Ind., has been acquired by the Ellicott Machine Corporation, Baltimore, Md. Under the agreement, all manufacturing rights, patents, engineering data, etc., of the American Steel Dredge Company for the design, manufacture, and sale of dredges and dredging equipment become the property of the Ellicott Machine Corporation.

Two new companies have been named as distributors of equipment manufactured by the Davey Compressor Company, Kent, Ohio.

The Truck Equipment Company, 3936 Walnut St., Denver, has been appointed Colorado distributor of Davey Auto-Air truck-mounted compressors. The company will also handle Davey power-take-offs for use with other equipment, and the full line of air tools.

Davey rotary drilling machines and accessories will be distributed in the State of Alabama by the Blackwell Trucking Company of Adamsville. The new distributor will handle the firm's entire line of six standard truck-mounted drills with rated capacities to 2,000 ft.

Rockwell Manufacturing Company, Pittsburgh, Pa., has acquired Ilo-Werke, G.m.b.H., a West German manufacturer of two-cycle, air-cooled diesel and gasoline engines. The German company, Rockwell's first wholly-owned manufacturing subsidiary in Europe, has its headquarters and principal factory in Pinneburg, near Hamburg, and also operates a plant at Munich.

In carrier landings, planes coming in at more than 100 knots are stopped in a split second. This amazing performance is made possible by having each plane hook onto one of several wire ropes stretched across the flight deck. Both plane and rope receive an almost unbelievable shock at the moment of contact. Needless to say, only top-quality wire ropes can be used for this application because . . .

you can't bargain with safety

While your use of wire rope differs from this carrier application, *safety should be just as important to you.* For, although a "bargain" rope may save you money, it can cost you your peace of mind. So don't bargain with safety. Buy a rope that's a *quality* rope—buy Wickwire Rope. 5049

WICKWIRE ROPE — A CF&I PRODUCT

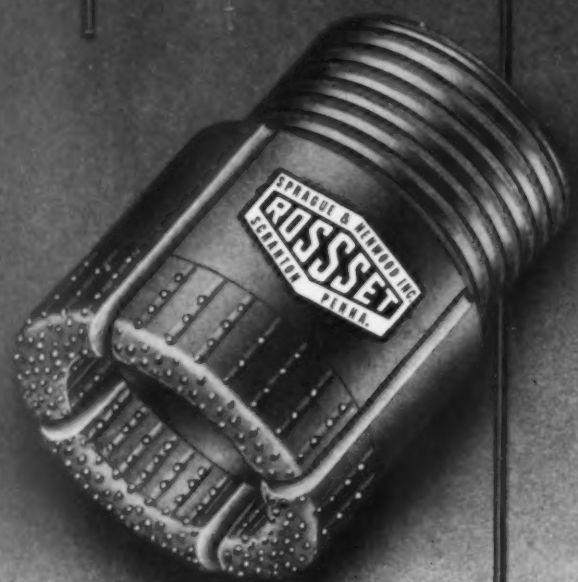
CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

LOOK FOR THE YELLOW TRIANGLE

THE COLORADO FUEL AND IRON CORPORATION—Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans
New York • Philadelphia

THERE IS THE RIGHT BIT FOR YOU... OUT OF A POSSIBLE COMBINATION OF THOUSANDS OF SIZES AND TYPES



WE CAN GIVE YOU THE RIGHT ONE

Based upon over 70 years of world-wide drilling experience, we have the right bit to use to obtain the best possible cores at the lowest cost per foot. Out of the many combinations possible with the four matrices, several stone size ranges, three grades of diamonds, and various face contours, there is the one "Oriented" Diamond Bit you want for the job you have to do.

Write today, giving all information you can provide. We will be glad to recommend the bit we believe to be the best suited to your drilling conditions. Always order or specify SPRAGUE & HENWOOD "Oriented" Diamond Bits. For the complete diamond bit story, write for our Diamond Bit Catalog No. 320-I.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA
GRAND JUNCTION, COLORADO • BUCHANS, NEWFOUNDLAND
EXPORT REP.: PHILIPS EXPORT CO., 100 EAST 42ND ST., N. Y. 17, N. Y. CABLE ADDRESS: PHILYORK

Dorr-Oliver, Inc., Stamford, Conn., has named the M. N. Dannenbaum Company, Houston, Tex., and Brown & Morrison, Charlotte, N. C., as exclusive D-O pump representatives in their respective areas.

M. N. Dannenbaum Co., located at 2421 S. Wayside Dr., in Houston, will stock, service, and market D-O pumps in the industrialized southeastern section of Texas. Brown & Morrison, 207 Liberty Life Bldg., Charlotte, will market and service D-O pumps in North and South Carolina.

John W. McGovern was elected president of United States Rubber Company, New York, N. Y., and designated chief operating officer by the board of directors.

Formerly executive vice-president, Mr. McGovern succeeds H. E. Humphreys Jr. as president. Mr. Humphreys continues as chairman of the board of directors and chief executive officer.

Mr. McGovern joined U. S. Rubber in 1920. After serving in numerous accounting, industrial engineering and production posts, Mr. McGovern became general manager of the tire division in 1943. He was elected a vice-president in 1945, a director and member of the executive committee in 1951, and executive vice-president in 1956.

Harold S. Falk, president of the Falk Corporation, Milwaukee, Wis., died at the age of 73.

As president of the Falk Corporation, Mr. Falk was nationally known and honored for his contributions to the highly specialized science of large-scale power transmission through shafts, couplings, and gears.

Orville B. Zimmerman has been promoted to the post of sales manager of Oshkosh Motor Truck, Inc., Oshkosh, Wis. In 1954 Mr. Zimmerman entered Oshkosh's sales engineering division, and in 1956 became assistant sales manager.

The Denver Equipment Company, Denver, Colo., has appointed Telco, Inc., 4030 Superior Ave., Cleveland, Ohio, exclusive pump dealer in the Cleveland area. Telco, headed by T. E. Longley, will handle the sales of Denver SRL pumps in all counties north of but not including Columbus, Ohio.

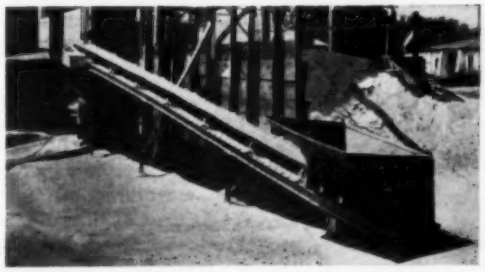
LONG HAUL—Even the longest Barber-Greene Conveyors are built of standardized components . . . produced on a precision, quantity production basis. They can be assembled in almost limitless combinations to cut the time and cost of any material handling job.

Long or short haul—it costs less to move materials with belt conveyors

Thousands of installations—ranging from a few feet to thousands of feet—prove that belt conveyors move bulk material at lowest cost.

No other machine is so simple in construction or requires so little maintenance. No other machine can deliver such high hourly capacities with so little power or attention.

Barber-Greene has given a new meaning to belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner . . . require less engineering . . . are erected faster . . . give top performance . . . and are more easily altered to meet changing or expanding requirements. Being standardized, repair parts are readily available—usually from the stock of your local distributor.



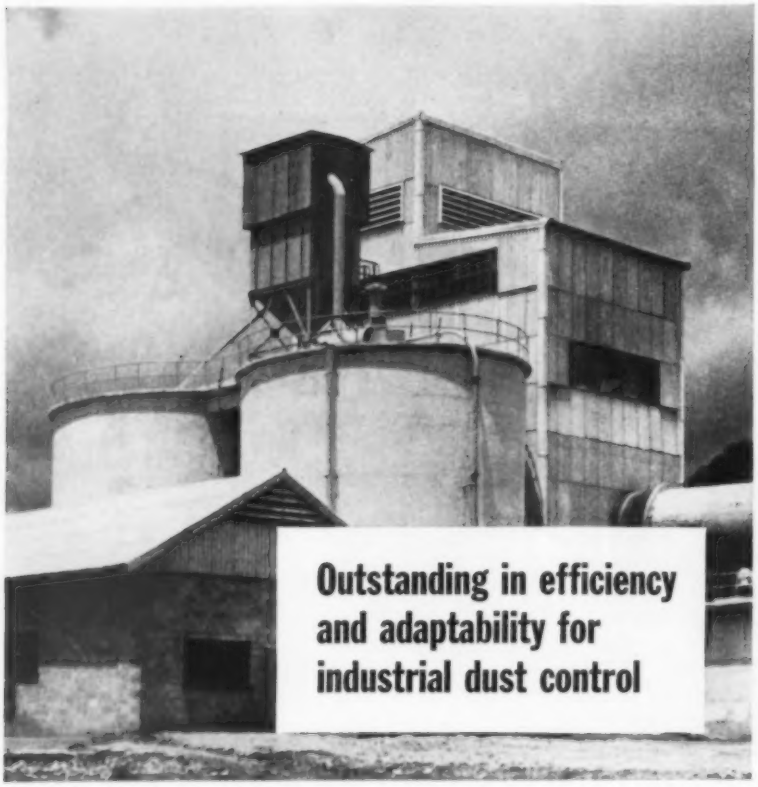
SHORT HAUL—Even the shortest Barber-Greene Conveyors are available in standardized components in the width and length to suit your needs. These small conveyors provide the economical way to handle the widest range of materials with greatest flexibility.

56-7-PE

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

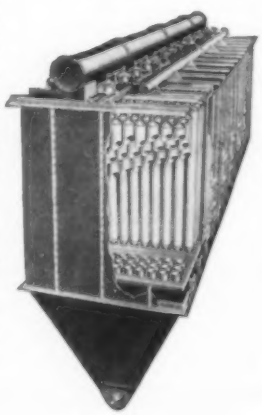
CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



Norblo *Automatic Bag Type*
DUST ARRESTERS

Wherever it is important that you have continuous high recovery of industrial dusts and fumes — for salvage or for good housekeeping — Norblo Automatic Equipment brings you many design advantages.

Here is dependable heavy duty collection service at low cost of operation and maintenance that pays for itself quickly. The principle of cyclic bag shaking and cleaning has proved itself for outstanding efficiency. Adjustment for varying dust loading can be made in a few minutes without shutting down.



If you have a dust problem or dust creating process that needs control, write us for free suggestions based on experience of over 40 years.

Norblo also builds centrifugal and hydraulic dust collectors, cement air cooling systems, and portable type dust collectors.

The Northern Blower Company
6407 Barberton Ave., Cleveland 2, Ohio • OLympic 1-1300

Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

The second factory school for authorized distributors was held by The Jeffrey Manufacturing Company's industrial division at the Columbus, Ohio, plant on October 1-3. The session was attended by 27 men representing distributor companies in the United States, Cuba, Mexico, and France. The training sessions featured Jeffrey crushers and vibrating equipment.

Certificates of achievement were presented to students by J. E. M. Wilson, vice-president in charge of sales, at the graduation banquet at the Scioto Country Club. Robert D. Prushing, assistant manager, distributor sales, conducted the school. Additional factory schools are scheduled to supplement the orientation sales meetings staged in the field for Jeffrey distributors.

Directors of the Ogden Corporation have announced the acquisition of The Eimco Corporation and the American Foundry and Machine Company, both of Salt Lake City, Utah.

Eimco manufactures diesel- and pneumatically - operated overhead loading and excavating equipment and filtration equipment. American Foundry and Machine is a producer of grey iron and steel castings.

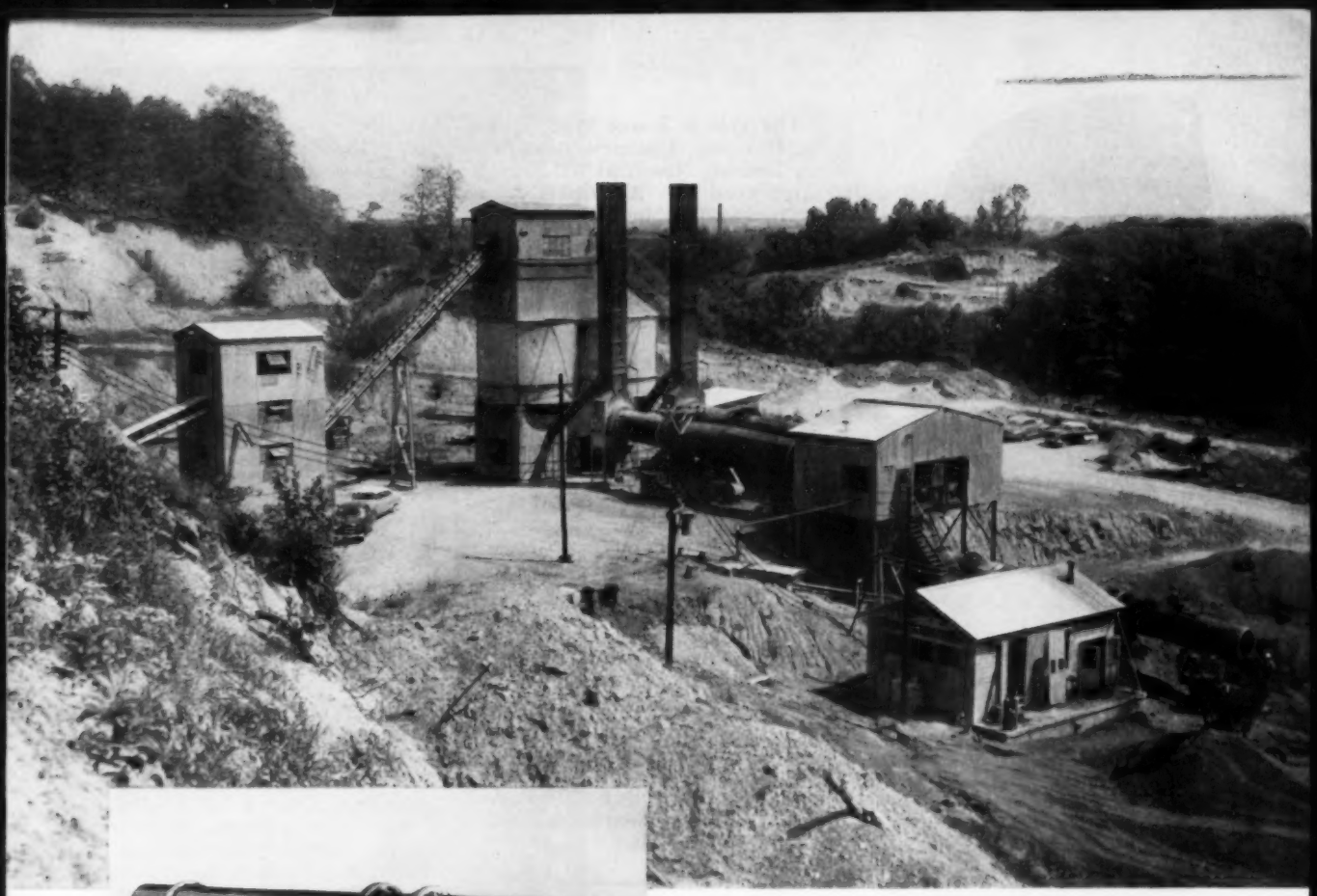
The companies' operations will continue to be managed by Joseph Rosenblatt, Eimco president, and Morris Rosenblatt, executive vice-president.

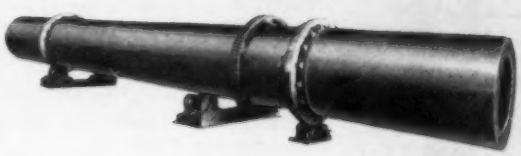
STANLEY MARWIN has been appointed assistant works manager of the Los Angeles, Calif., plant of the American Manganese Steel Division of American Brake Shoe Company, New York, N. Y.

Formerly assistant to the works manager, Mr. Marwin has been with the Amsco Division since 1934, and has held numerous positions in production and supervision at various plants in the division.

Appointment of C. J. WILHITE as manager-field service for the Cummins Engine Company, Inc., Columbus, Ind., has been announced. Mr. Wilhite has been affiliated with the Cummins Engine Company since 1939, and was assistant sales manager prior to his new appointment.

In his new capacity, Mr. Wilhite is responsible for coordinating the activities of area service managers and the export and manufacturer service managers.





GET HIGH QUALITY
Lightweight Aggregate
WITH McNALLY PITTSBURG BUILT PLANTS

McNally Pittsburg Researchers, Designers, and Engineers have made a careful study of the best processing methods and equipment for profitable manufacture and processing of lightweight aggregates.

A vital part of lightweight aggregate plants are the rotary kilns. For increased production, install McNally Pittsburg rotary kilns. These ruggedly built kilns have a low maintenance cost.

For more information write for our Lightweight Aggregate brochure, "Let's Get in a New Business."

COMPLETE PLANTS OR SINGLE UNITS

- ROTARY KILNS
- COOLER
- CONVEYORS
- ROLL CRUSHERS
- JAW CRUSHERS
- VIBRATORS
- CLAY DISINTEGRATORS
- CLINKER BREAKERS
- HOISTS
- RECIPROCATING FEEDERS
- APRON FEEDERS
- MATERIAL HANDLING EQUIPMENT

McNALLY PITTSBURG MFG. CORP.
DESIGNERS AND BUILDERS OF EQUIPMENT FOR BASIC INDUSTRY

GET THIS FREE BROCHURE AND SPECIAL INFORMATION

McNally Pittsburg Mfg. Corp., Dept. P
Pittsburg, Kansas

Gentlemen:

Please send brochure on Lightweight Aggregate plants. ☐

Desired capacity of plant per day is_____.

Shale ☐ Clay ☐

Name_____ Title_____

Company_____

City and State_____

EXTREMULTUS belts ABSORB SHOCK and VIBRATION

EXTREMULTUS is the revolutionary new power transmission belting that combines the shock absorbing properties of an elastic, incredibly strong core of polymer with the unexcelled friction surface of specially chrome tanned leather. In addition to absorbing shock and vibration, EXTREMULTUS will not stretch on fixed centers and runs at speeds over 10,000 feet per minute! Write today for descriptive catalog.

EXTREMULTUS, INC.
405 LEXINGTON AVE., NEW YORK, N. Y.

The Yale & Towne Manufacturing Company, Contractors Machinery Division, New York, N. Y., has appointed the Aldridge-Harbour Equipment Co., Inc., Highway 80 West, Jackson, Miss., as distributor for the Trojan line of tractor shovels for the State of Mississippi.

Hawkeye Machinery Company, 1225 Walnut St., Des Moines, Iowa, has been appointed to sell and service *Michigan* tractor shovels, tractor dozers, and excavator cranes, products of the Construction Machinery Division, Clark Equipment Company, Benton Harbor, Mich.

Hawkeye will represent tractor shovels in the Iowa counties east of and including Dickson, Clay, Buena Vista, Sac, Carroll, Audubon, Adair, Union, Ringgold; and west of and including the counties of Worth, Cerro-Gordo, Franklin, Hardin, Marshall, Jasper, Marion, Monroe, and Appanoose.

Their excavator crane territory will be all Iowa counties east of and including Mitchell, Floyd, Butler, Grundy, Tama, Poweshiek, Mahaska, Wapello, and Davis.

The appointment of ROBERT G. ROBEY as sales manager of the F. P. Smith Wire and Iron Works, Chicago, Ill., was recently announced. In his new position, Mr. Robey will supervise the company's entire sales operation.

EDWIN T. GOREE has been promoted to assistant general sales manager of the Bucyrus-Erie Company, South Milwaukee, Wis. Formerly assistant sales manager excavator distributors, Mr. Goree has been affiliated with the firm since 1947.

One of the first Defense Department Awards in eastern Pennsylvania was presented on September 25 to the Fuller Company, Catasauqua, Pa.

Attended by high ranking military officers, the presentation was part of a colorful outdoor ceremony held in the parking area beside the company's new engineering building.

Maj. Gen. James R. Pierce, Deputy Commander, 2nd U. S. Army, read a citation congratulating the Fuller firm for its outstanding cooperation and assistance in the Reserve Component Program. A blue pennant from the Defense Department was raised and flown on the company's flag pole.

The group was addressed by Maj. Gen. A. J. Drexel Biddle Jr., Adjutant General of the Commonwealth of Pennsylvania. Remarks were also made by A. E. Douglass, chairman of the board of Fuller; and W. J. Stebler, president of the General American Transportation Corporation, parent company of Fuller.

Accepting the citation was Col. G. K. Engelhart, U.S.A.R. (ret.), vice-president of Fuller.

SELF-SUPPORTING Rugged Steel Construction

DUST-TIGHT HOUSING with Micarta & Nylon Shaft Seals

OBSTRUCTION FREE INTERIOR

PRECISION FITTED COMPONENTS

50 YEARS EXPERIENCE In Building Top Quality Bucket Elevators

Feature For Feature Universal BUCKET ELEVATORS ARE YOUR Best Buy!

Universal Bucket Elevators are suitable in many applications for handling free flowing granular or powdered materials in capacities up to 3750 cubic feet per hour and heights up to 125 feet.

Consult Our Engineering Department for Recommendations On YOUR Needs

UNIVERSAL HOIST CO.
P. O. BOX 119 CEDAR FALLS, IOWA

Over four years without overhaul using Cities Service C-300 Motor Oil!

When Northwest Sand and Gravel's pit of earth suddenly became a lake, it didn't drown out the company's operation or its spectacular performance results.

WATER OR NO WATER, Northwest continues to haul out 170 truckloads of gravel a day . . . and its crane continues to run without overhaul using Cities Service C-300 Motor Oil.

To date, the dragline has gone over four years without overhaul, and a front-end loader has chalked up three. Moreover, that's typical of the results Northwest has been getting with all its equipment, according to Supt. Alfred Karkut. He sums it up this way: "Since we've been using Cities Service products, we've had absolutely no trouble with any of our machinery. To me, there's no better testimony to a product than that."

Mr. Karkut puts it very simply. What more can be said about a lubricant except that it keeps machinery operating flawlessly? And what more can we say about Cities Service except to remind you to talk with a Cities Service Lubrication Engineer for similar performance? Call him in this week. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

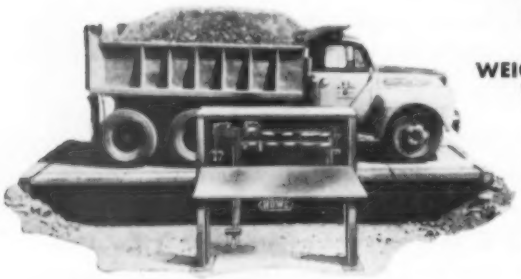
QUALITY PETROLEUM PRODUCTS

Faster, Lower Cost Handling of

ASPHALT CEMENT AGGREGATES

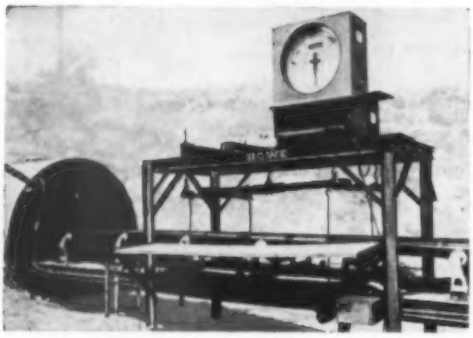
AUTOMATIC BATCHING

is simple with the Howe Batchmaster. Adjust the ingredient setup panels to the desired formula, touch a button, and the mix is automatically proportioned, including aggregates and cement or asphalt. Accessories such as automatic recording—mixer time controls—moisture compensation and many more are available. Systems tailored to your operations.



WEIGH ANYTHING ON WHEELS, ANYWHERE!

Take Howe Portable Vehicle Scales to the site, set up on timber or concrete footings—no pit needed. Capacities 20 to 70 tons—lengths 20 to 60 feet.



WEIGH MATERIAL IN MOTION

to high accuracy, with Howe Conveyco Conveyor Scales on existing conveyors or as self-contained units. Control conveyor speed or feeder rate for steady discharge—automatically.

From the simplest weighing requirements to automatic control of materials by electronics, you'll find the *right* weigh is the HOWE way—developed out of a century of experience with industrial scales. For immediate service from any of 23 branches with fully equipped service departments, consult the yellow pages of your telephone directory.

The HOWE SCALE Co
A SUBSIDIARY OF SAFETY INDUSTRIES, INC.
RUTLAND • VERMONT

R. L. Halsted

E. H. Baxa

Two new appointments have been announced by directors of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

ROBERT L. HALSTED, formerly manager of the processing machinery department, was named general manager of the Industrial Equipment Division. Since joining Allis-Chalmers in 1935 as a salesman, Mr. Halsted has served as manager of the Charleston, W. Va., office, manager of the Cleveland, Ohio, office, and manager of the Central Region. He was appointed manager of the processing machinery department in 1955.

EDWARD H. BAXA succeeds Mr. Halsted as manager of the processing machinery department. Mr. Baxa has been affiliated with Allis-Chalmers since 1941 when he joined the firm's processing machinery department. He had been engineer-in-charge of pyro-processing machinery since 1953.

The appointment of GLENN R. AGGAS as *Lima* sales representative in the Pittsburgh and Harrisburg, Pa., and Clarksburg and Charleston, W. Va., areas has been announced by the Baldwin - Lima - Hamilton Corporation, Lima, Ohio.

Also announced is the appointment of EDWARD R. GEE as sales representative for *Lima* shovels, cranes, and draglines in the Eastern District. In this capacity, Mr. Gee is actively working with Metalweld, Inc., Philadelphia, and John C. Louis Co., Baltimore, Md., *Lima* distributors.

JOHN R. HALE, manager of the Chase Bag Company branch in Minneapolis, Minn., since 1937, has been appointed Midwestern Regional Sales Director for the firm. Mr. Hale will make his headquarters in Minneapolis.

Included in the Midwestern Region are the Minneapolis, Kansas City, St. Louis, Chicago, and Milwaukee offices of Chase Bag.

WHY
Kensington Tracks
LAST SO LONG

There are two reasons why KENSINGTON tracks give longer service, even under the severest working conditions.

First, vastly improved design.

Second, they are made from a superior, wear-resisting alloyed manganese steel.

New design. KENSINGTON tracks have only three parts . . . the rail, the grouser, and the pin. Rails are cast in *one piece* to add strength and prevent wear caused by the constant twisting and weaving found in ordinary tracks.

Grousers have anti-shear lugs which fit snugly over the tie bar of the link to eliminate loose plates, elongated bolt holes, and side-sway. Grousers are heavied-up at all critical points to better resist bending and breaking.

Pins, constructed of a special alloy, are pressed tightly in place under high pressure to give further rigidity and near-perfect alignment.

Yet, even with all these design improvements, KENSINGTON track assemblies fit all standard, popular make crawler tractors.

Steel with stamina. Development of several remarkable wear-resisting alloyed manganese steels, including ORO Supermang and Kenkrome, has also increased the wear-ability of KENSINGTON tracks. These already-hard metals *actually fight back against wear!* They develop *extra* surface hardness when exposed to friction, abrasion, or impact. Yet, under this ever-hardening "skin," these metals stay tough and strong. That's why KENSINGTON uses Kenkrome in its rails and Supermang in its grousers.

Economical, too. Though KENSINGTON tracks cost slightly more than those supplied by the tractor manufacturer, they enable you to make substantial savings.

They give you many more hours of service per dollar of cost, less time lost for maintenance, and increased operating efficiency because KENSINGTON tracks keep their "pull-bracing grouser area" for a longer period of time. Also, you can maintain a smaller inventory of repair parts.

Discover for yourself how many hundred dollars these tracks will save you over the next few years.

Other wear-resisting KENSINGTON replacement parts

FOR TRACTORS
Kenkrome replacement rims for worn sprockets. Ready to weld on.

CRUSHER PARTS
Jaw plates, roll shells, mantles and bowl liners, hammers, grate bars and liners, etc.

FOR SHOVELS
Treads, rollers, racks, pinions and teeth . . . to fit all standard shovels.

CHAIN AND SPROCKETS
150 standard chains listed in new KENSINGTON Catalog plus many special chains. All of wear-defying Kenkrome.

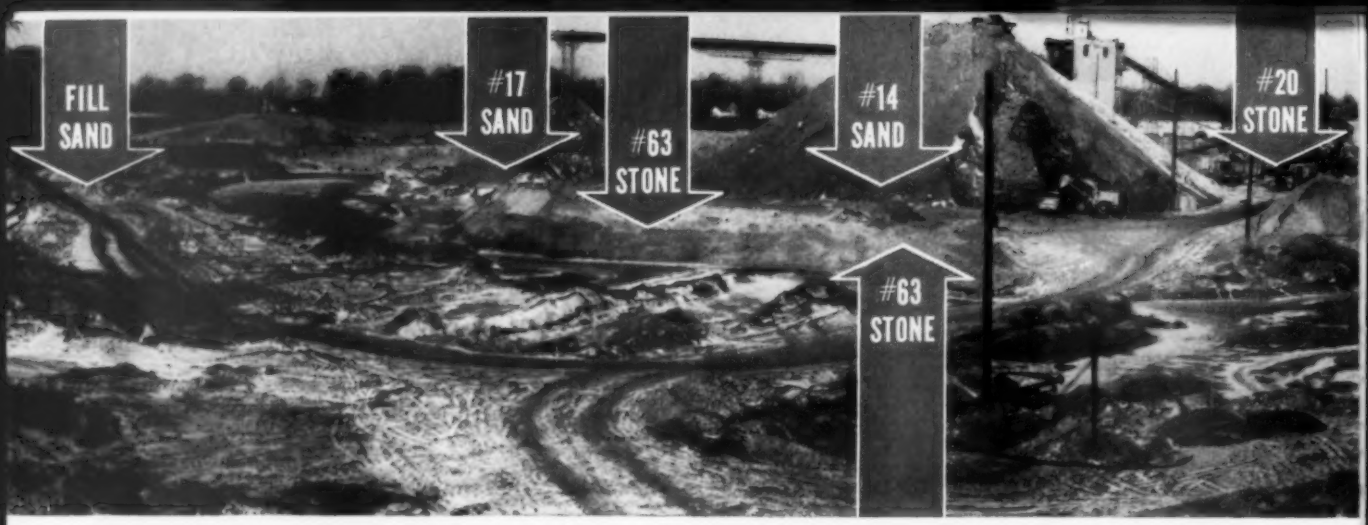
Mail the coupon for further details on how much KENSINGTON tracks will save you in the "long pull."

Kensington STEEL

KENSINGTON STEEL, Dept. P, 505 Kensington Ave., Chicago 28, Ill.
DIVISION OF POOR & COMPANY, CHICAGO

Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of Tractor_____
Model_____ NO. TRACKS PER BELT_____ WIDTH OF GROUSER_____
NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____



Same hours, same manpower, yet by changing loaders

INDIANA QUARRY QUADRUPLES PRODUCTION

With the same ***number*** of loaders, and virtually the same number of man-hours, May Sand & Gravel Company, Fort Wayne, has *quadrupled* production (and sales) over the past few years.

Key to their 750,000 ton yearly success story has been the three Michigan Tractor Shovels they brought in to replace a number of less mobile loading units.

Load 550 trucks with 4,500 tons

Accurate records, covering a two year period, show the three Michigans load from 300 to 550 trucks ***every nine hour shift.*** During peak days their output totals 4,500 tons —a per-unit per-hour average of 175 tons!

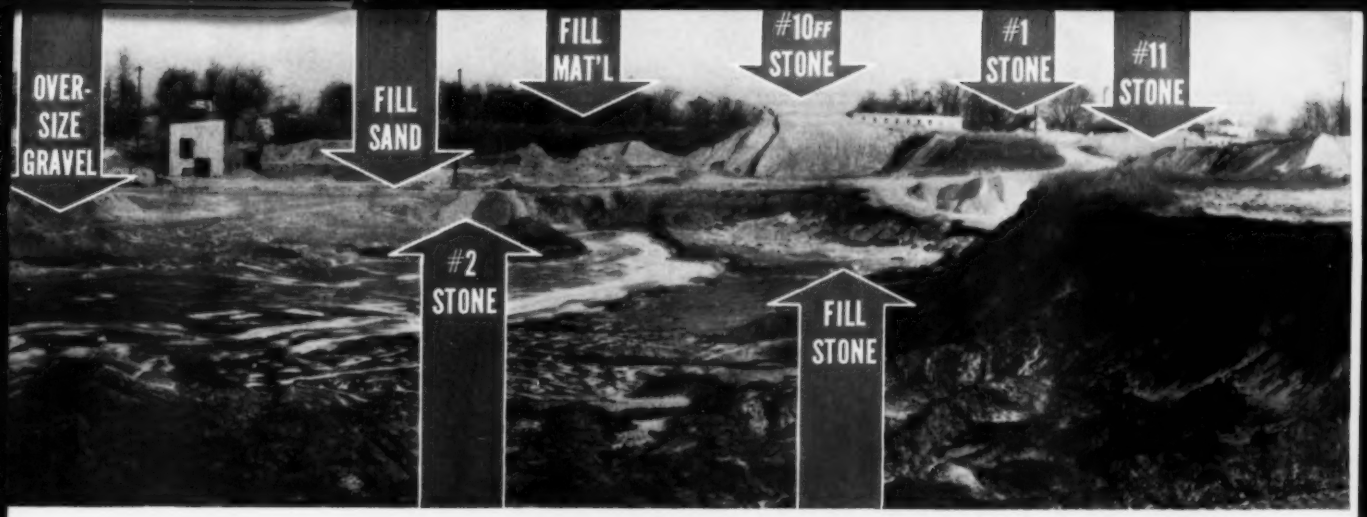
Truckers clear $25 more per day, end gripes

This excellent record has been compiled with only minor changes in methods. Trucks, for example, still are loaded in the order they come into the pit. Formerly, this practice caused frequent delays, often 20 to 40 minutes, while old-style loaders crawled between stockpiles, or labored to load the tougher materials. Now, ***even on busiest days,*** the Michigans work so fast no trucker waits longer than 2 to 10 minutes from time he drives into the yard until time he's loaded and pulls off the scales. "Trucker gripes have almost disappeared," says Company President Bill May. "The saving of 10 to 30 minutes in pit service often enables each truck to deliver another load or two a day when on long 15 mile hauls . . . an extra two to four loads a day when on shorter one to five mile hauls. That's an extra profit per truck of $5 to $25—or more—every day!"

Fast as trucks between stockpiles

Two major factors combine to produce this time saving. First, the mobile Michigans move from stockpile to stockpile just about as fast as the trucks. Second, the Michigans rapidly load all 10 sizes of stone, two types of gravel, and two grades of sand sold by this plant. Stopwatch measurements, taken from time to time during the past two years, show the 2¾ yard Michigans require only 1½ to 1¾ minutes to heap a 5 yd truck . . . 2¼ to 2½ minutes to load a 9 yarder.

Typical Michigan 2¾ yd load of #14 sand, heaviest of 14 materials handled, weighed out on company scales at 9,000 lbs.



Truck-like speed between stockpiles saves about 1¼ hours per day over crawler-loaders formerly used. Supt. Rooney estimates this time saving, plus lowered repairs, plus faster loading nets his company $70 extra profits per Michigan per shift.

Easy accessibility speeds maintenance

Another important factor in increased plant production has been *dependability*. May Sand and Gravel records show that *not once* in 5½ machine years has a Michigan missed more than a few hours of work. "Sure, we expect our rough service to take its toll," says Jim Rooney, Supt. "But we have a regular program of daily and 100 hour maintenance and inspection that catches what few troubles a Michigan has while they're small. Even when we spot something, even in the rare cases a Michigan breaks down, we always have the machine back to work the next morning! Easy accessibility, skilled workmen, and excellent distributor cooperation make repairs a simple job."

Also do such "extra jobs" as bank loading, pit cleanup

Speed and efficiency help out on extra jobs, too. Three hours every night, and sometimes during the day, one or two of the Michigans clean the quarry floor (this eliminates need for special tractor). Sometimes they load sand fill from bank direct into trucks. At times they level the gravel stockpiles. From 5 to 10 pm some evenings, two of them load non-blasted bank-run sand and gravel. Three trucks are kept busy hauling 2,000 ft to plant for processing. Only light source is own headlights. Average production: 230 tons per hour. And the Michigans have ended worries about rock shovel breakdowns. Supt Rooney reports production loading shot rock with a Michigan of 190 to 200 tons every hour.

Is it any wonder, with all-around performance like this, that May Sand & Gravel Company think Michigan "tops". We think, if you try one, you'll agree. Make your own test. Call or write to arrange a demonstration. You name the job!

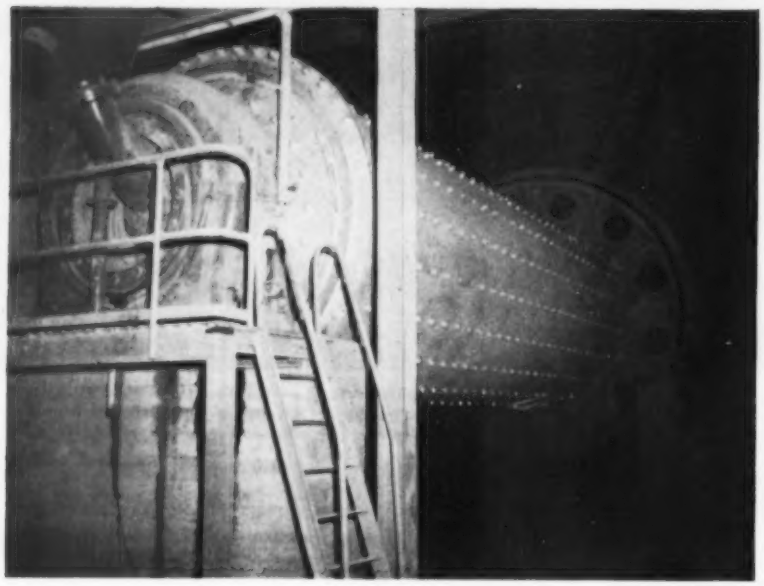
Michigan is a registered trade-mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2479 Pipestone Road
Benton Harbor 37, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

One of Michigan's "spare-time" jobs: hurrying to edge of 30 acre quarry to push off truck-dumped #1 stone.

Excellent service and cooperation from local distributor Deeds Equipment Company is one important reason for May's repeat purchases.



GRINDING BALL WEAR RESISTANCE INCREASED 400%

Recent tests in several cement plants have shown that in dry grinding, Calumet Ni-Hard* grinding balls provide a 400% increase in resistance to wear when compared to forged steel balls used in an identical operation. If you operate cement clinker grinders these same impressive savings can be yours.

And in wet grinding of copper ore, the same Ni-Hard balls indicate a 40% reduction in grinding balls costs per ton of ore ground!

All Calumet Ni-Hard grinding balls are the result of thorough testing and careful quality control. Balls are available from stock in the following sizes: 5/8", 3/4", 7/8", 1", 1 1/4", 1 1/2" and 2". More information is available without obligation—just write!

**Reg. U.S. Pat. Off., Intl. Nickel Co., Inc.*

CALUMET & HECLA, INC.
CALUMET DIVISION
WOLVERINE TUBE DIVISION
FOREST INDUSTRIES DIVISION
CALUMET & HECLA OF CANADA LIMITED
CANADA VULCANIZER AND EQUIPMENT COMPANY LIMITED

CALUMET DIVISION

of Calumet & Hecla, Inc.

1 CALUMET AVENUE • CALUMET, MICHIGAN

HARRY HENNESSEY has been appointed district sales representative for the southeastern United States by the Contractors Machinery Division of the Yale & Towne Manufacturing Company, New York, N. Y. The division manufactures Trojan tractor shovels.

Mr. Hennessey will handle the products of this Yale & Towne division in Georgia, North and South Carolina, Kentucky, Alabama, Mississippi, and Tennessee.

H. Hennessey

R. P. Broohs

ROBERT P. BROOHS has been promoted to assistant sales manager of large machines and blast hole drills by the Bucyrus-Erie Co., South Milwaukee, Wis.

Mr. Broohs, Northwestern sales manager at Seattle, Wash., since 1954, will now have his headquarters at the south Milwaukee office. He joined Bucyrus-Erie under a special apprenticeship in 1946 and was later assigned to Seattle as a small shovel sales representative, a position he held until his promotion in 1954.

Appointment of H. E. DENNIE as eastern regional sales director of the Chase Bag Company, Chicago, Ill., has been announced. Mr. Dennie will continue as manager of the firm's Philadelphia manufacturing branch.

Mr. Dennie joined Chase Bag in 1945 in the advertising department, and subsequently was a sales representative in the Chicago territory. He was made sales manager at Philadelphia in 1952, and was promoted to manager in 1955.

W. J. HANNON has been appointed Chicago District sales manager for Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis, Mo. The district includes Michigan, Wisconsin, Minnesota, North Dakota, eastern Iowa, and northern Illinois and Indiana. Mr. Hannon was formerly district representative for Leschen in the St. Louis territory.

Why Wyandotte Chemical Corp. chose this dozer *(a Michigan)*

"Like most quarries, we have a lot of widely-scattered, repetitive jobs to do," writes William Hagen, veteran manager of Wyandotte's big Alpena, Michigan, limestone quarry. "Trouble was, our crawler-dozers just couldn't handle 'em efficiently—moving, as they must over rocky surfaces, at only a couple of miles per hour. And the cost of track maintenance was pretty awful. Major cause of track wear is travel, of course . . . so we tried to limit *both* as much as possible by putting a crawler on each operating level and another on the stockpiles. Didn't help much, though. Breakdowns would still upset our schedules *several days per week*. So we decided to look at some rubber-tire dozers." They tried one type. It was unsatisfactory. Then Wyandotte's local Michigan Distributor, Michigan Machinery & Equipment Co., arranged an on-the-job demonstration.

Makes hour crawler move in 7 minutes

"From the moment our trial Michigan drove off the flatcar, it was *busy*," Hagen continues. "First job on the docket was leveling a dump area on our macadam storage pile. The Model 180 dozed enough area to last an 8-hour shift —in only 28 minutes! Then, because *two* of our crawlers were down for repairs that day, we drove the Michigan a mile to our shovel loading area. *In less than 4 minutes* it was at work, cleaning up ahead of the 6 yard electric shovel and opening the way for trucks. Half an hour later, we moved back to macadam storage —a 3-minute trip this time. One of our crawlers would have taken a whole hour for the 2 mile round trip alone! Later, the Michigan assisted in moving our big quarry shovel; transfer of the power feed cable and area cleanup were handled faster than ever before. We also used the Model 180 Dozer to move drilling machines, air compressors and shanties . . . to strip shallow overburden . . . clean around the surge bin . . . maintain roads . . . and to level the flux stone stockpile. Nowhere in these operations did the Michigan have a bit of trouble. With performance like *this*, we were sold!"

Only 1 repair job in 5,800 hours

Hagen finds their Michigan today does all of these tasks and many more around this 450-acre quarry. The Model 180 actually works 16 hours a day, 7 days per week. Quarry Superintendent B. C. Raymond estimates its tire wear to be *1/6 as costly* as track maintenance on the crawlers. Its mechanical efficiency has been excellent . . . in the past year, it has been down for repairs *only once*. Operators say "Michigan drives like a new car . . . avoids constant jarring of a crawler . . . gets us on the spot *fast* . . . has fine visibility fore and aft. *We like it!*"

Want to move in on bottlenecks too?

We'll bet a Michigan Dozer can break production bottlenecks for *you*, too. Won't cost you a cent to find out—your local Michigan Distributor will be glad to arrange a thorough demonstration. You pick the time. You pick the job. No obligation, of course. And ask him about the popular Clark Lease-Purchase Plan, which lets you put a Michigan to work without investing a penny of capital. Other finance plans available—choose the one you like best!

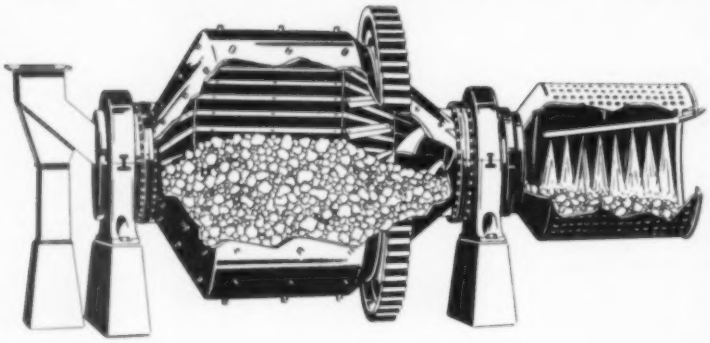
Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2479 Pipestone Road,
Benton Harbor 35, Michigan

In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario

CLARK® EQUIPMENT

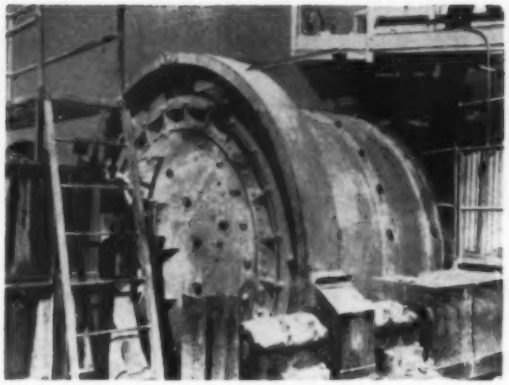
HARDINGE SCRUBBERS FOR PIT-RUN MATERIALS



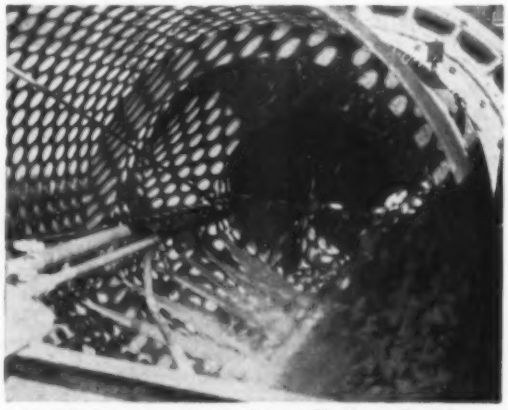
Large diameter, short length trunnions permit chute feeding of unsized ore and rock at rates up to 600 tons per hour.

The mass loading and ball-mill action in the scrubber quickly and completely slurries the clay and dirt, permitting ready separation on washing screens or trommels.

Complete specifications upon request. Bulletin 37-B-8.



Crushed dolomite presents a difficult cleaning problem. The Hardinge 10′ x 66″ scrubber above is doing the job satisfactorily in a California dolomite plant.



Scrubbed stone emerging from a Hardinge Scrubber into a washing trommel which rotates with the Scrubber.

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA · 240 Arch St. · Main Office and Works

New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco

Herb J. Hawthorne, Inc., Houston, Tex., manufacturer of Blue Demon replaceable blade drill bits, has acquired the National Oil Tool Company, Inc., Wichita, Kans., as a planned step in a long range expansion program.

The National Cone-Type Rock Bit, which has been distributed throughout the United States and Canada for hard formation drilling, will be added to Hawthorne's Blue Demon bit line.

The Wichita plant will be operated as a branch plant of Herb J. Hawthorne, Inc., with all administrative and sales responsibilities for the National Rock Bit to be handled from Hawthorne's Houston headquarters.

HENRY DAVIS JR. has been appointed assistant manager of branch sales for the mechanical goods division of United States Rubber Company. His new headquarters will be at the firm's main office in New York City, N. Y.

Mr. Davis joined the rubber company in 1945 as a technical trainee in mechanical goods. He last held the position of district sales manager.

ROBERT C. ECKERT, KIRK H. STERLING, and FRANCIS X. SULLIVAN have joined the Lincoln Electric Company's district offices at Baltimore, Md.; Charlotte, N. C.; and North Haven, Conn., respectively. All three of these men were in the company's training program at the home plant in Cleveland, Ohio.

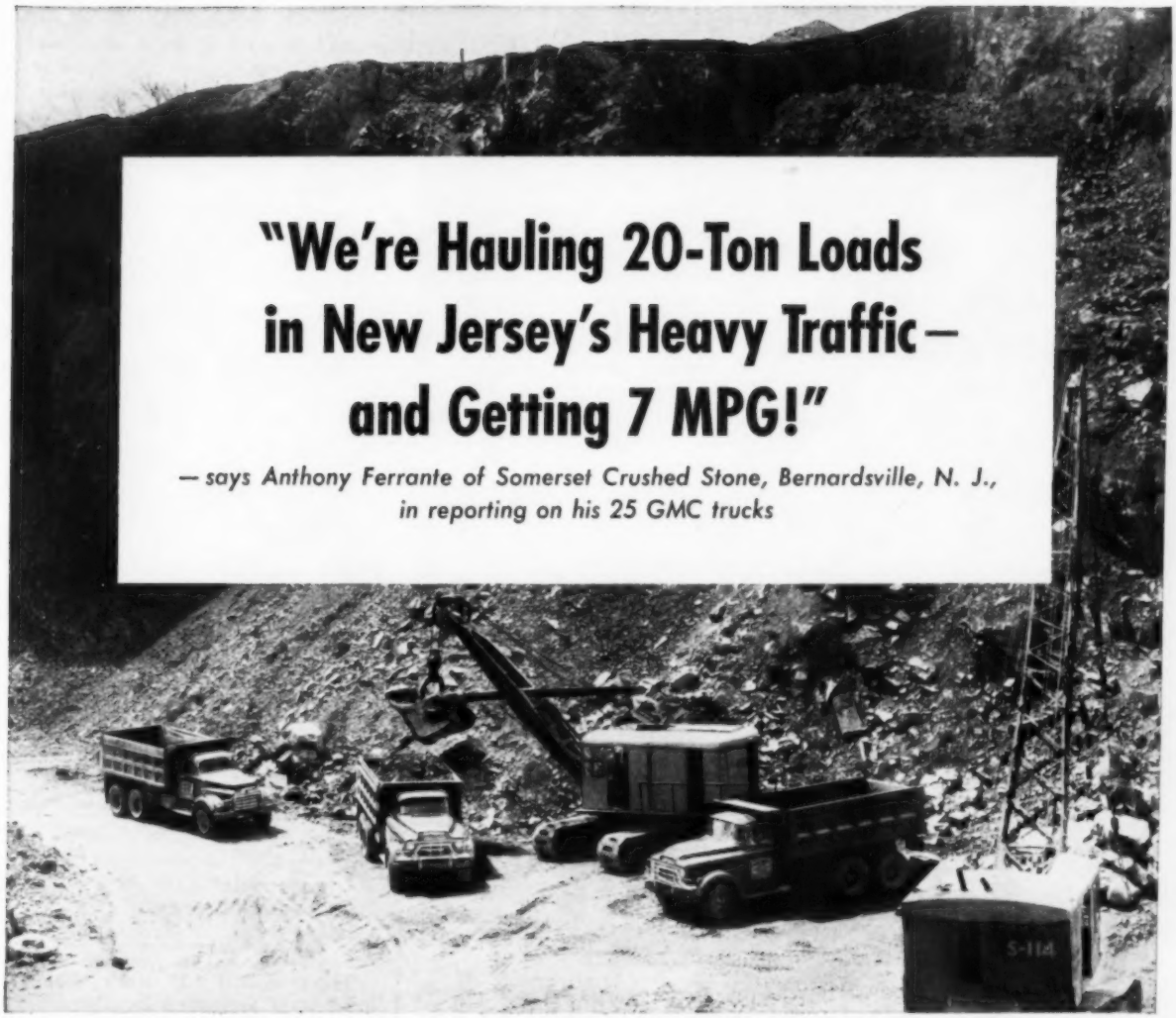
R. N. BIGGERS has been named vice-president and general manager of the Hobbs Trailer Division of the Fruehauf Trailer Company, Detroit, Mich., with headquarters in Ft. Worth, Tex. Mr. Biggers succeeds William E. Grace, who was elected executive vice-president of Fruehauf.

Mr. Biggers has been with Hobbs since 1939. He has served as assistant sales manager of Hobbs, Lubbock, Tex., branch manager, vice-president in charge of sales, and most recently general sales manager.

Merkle-Korff Gear Company has appointed the Zaslow Sales Company, 108 Foxcroft Rd., West Hartford, Conn., to represent its line of fractional horsepower geared motors and industrial and display turntables in the New England states.

"We're Hauling 20-Ton Loads in New Jersey's Heavy Traffic— and Getting 7 MPG!"

— says Anthony Ferrante of Somerset Crushed Stone, Bernardsville, N. J., in reporting on his 25 GMC trucks



WHILE CLOCKING 50,000 TOUGH MILES A YEAR—in a punishing combination of on-and-off-the-road work—Somerset's GMC W635's turn in amazingly low operating figures. Down-time has been considerably less than the other-make trucks in the fleet, Truck Manager George West reports. And the new GMC rear ends have given them *exceptionally satisfactory service*. Yet these GMC's aren't pampered. In fact, each rig puts in *two years* of hard work before it gets even a carbon and valve job.

POWER TO ZOOM 14-YARD LOADS UP OUT OF THE PIT FAST comes from GMC's big 225-hp "503" engine. And once on the highway, that quick-stepping power helps cut trip-time—make more trips during normal working hours. What's more, Somerset is getting this standout GMC performance on an amazing 7 mpg — even though they travel some of the busiest New Jersey highways. That's a full mpg better than comparable trucks doing the same job.

"THOSE GMC's ARE NO. 1 IN OUR FLEET," says Somerset owner, Anthony Ferrante. His reason: Simply that the GMC's cost less to operate—so they make more money. Result: At last report, they had just put 8 more GMC's to work!

GMC TRUCK & COACH
A General Motors Division

Drier, Cleaner Finished Product

. . . HEAVIER CONSTRUCTION

Heavier constructed throughout, these units are designed to exceed the service life of competitive washers, while assuring low-cost removal of waste and water. Among significant design features are: (1) grease-lubricated, antifriction bearings, sealed against water and sand, (2) simplified drive, (3) sufficient rigidity to be set anywhere without supports under center of box. *Write for Bulletin SW-953.*

McLANAHAN SINCE 1835

SCREW WASHERS

McLANAHAN & STONE CORPORATION

253 Wall Street, Hollidaysburg, Pennsylvania

McLanahan Single Screw Washer.

(Far left) Single Screw Washer dewatering concrete sand.

Cleaning and classifying coarse and fine sands with McLanahan Screw Washers.

RAY M. RONALD has been appointed manager of the Hyster Company's tractor equipment division at Peoria, Ill. In his new position, Mr. Ronald will be responsible for all activities connected with Hyster's tractor equipment division and the Peoria plant.

Prior to his recent appointment, Mr. Ronald was located in Portland, Oreg., as sales manager of the company's western division. He has been with Hyster for 28 years.

R. M. Ronald

D. B. Perlis

Western Precipitation Corporation, Los Angles, Calif., has promoted D. B. PERLIS to product sales manager in charge of Dualaire collectors.

Mr. Perlis joined Western Precipitation ten years ago. His activities in the Engineering, Research, and Technical Departments have included project responsibility for all development and design work on the Dualaire product lines.

Three new FWD truck dealers have been appointed by the Four Wheel Drive Auto Company, Clintonville, Wis.

Ray Long Equipment, Inc., Columbia, S. C., will handle sales, parts, and service in the state of South Carolina.

Motor Fleet Service, 425 Kentucky Ave., Indianapolis, Ind., will represent FWD as sales, parts, and service dealer in Boone, Hamilton, Hancock, Shelby, Johnson, Morgan, Hendricks, and Marion counties of Indiana.

J. D. Motor Service, 8121 Market Street Rd., Houston, Tex., has been franchised as an FWD parts and service dealer only. The firm will handle parts supply and service for all lines of FWD trucks in Harris County, Tex.

JOHN H. SCHERER has been appointed to succeed RAYMOND F. ALLEN as vice-president and director of marketing and sales of the Thermoid Company, Trenton, N. J.

STOODY 1030

A new, low-cost hard-facing electrode that excels in *POSITION* WELDING!

Here's a new Stoody hard-facing rod especially made to fulfill several "musts"! *Stoody 1030 is unusual in its all-position weldability!* This means easier, faster hard-facing on much larger equipment...equipment which has to be hard-faced in the yard or on the job...equipment which can't be positioned to facilitate a down-hand welding setup!

TOP WEAR RESISTANCE within its price class! Stoody 1030 fits between Stoody Self-Hardening and Stoody 21 in wear qualities, favoring the latter. It satisfies all requirements where good abrasion resistance is essential, at the same time saves several cents per pound.

EXCELLENT COMPRESSIVE STRENGTH adapts Stoody 1030 to such applications as roll crushers; also sides, lips and teeth of power shovel buckets; drag lines and clamshells; carrying scraper blades, runners, etc.

APPLICATION—Either AC or DC, with a choice of straight or reverse polarity on DC. 3/16" rods weld at 140-220 amps, 5/16" rods at 225-275 amps. Straight polarity induces very fast burn-off and minimum penetration. Deposits set up rapidly, easily holding edges of welds. Spatter is negligible; overall application efficiency is approximately 78%. No slag covering results, makes easy multiple passes. Complete size range from 5/32" to 5/16".

Try Stoody 1030 on your next job—test its position welding advantages and wear resistance...make extra savings with its low cost!

Literature on Stoody 1030 is available from your Stoody Dealer (check the Yellow Pages of your phone book) or write direct.

STOODY COMPANY
11971 East Slauson Avenue
Whittier, California

you DIG more

with BREAKOUT action

. . . and 40° bucket tip-back ***at ground level,*** both of which are productive features EXCLUSIVE with "PAYLOADER" tractor-shovels. They can not be found on any other rubber-tired loader.

To the user they mean that loads can be obtained easier and faster with less strain on the machine and bigger loads can be RETAINED in the bucket with the 40° tip-back AT GROUND LEVEL.

The FIRST four-wheel-drive tractor-shovels were introduced by The Frank G. Hough Company just ten years ago and many of them are still in daily use. Neither they, nor any of the numerous copies being offered are as productive as these new "PAYLOADER" models.

Every "PAYLOADER" distributor not only invites comparison but will be glad to PROVE in ACTUAL DEMONSTRATION all of the points of "PAYLOADER" superiority.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

11-8-1a

you CARRY more

with CUSHIONED loads

. . . using hydraulic load-shock absorber as standard equipment on all four-wheel-drive "PAYLOADER" models, another HOUGH EXCLUSIVE.

It doesn't matter what kind of an extra big load an operator was able to get to begin with if most of it is lost in SPILLAGE while traveling.

The "PAYLOADER" load-shock absorber does not completely eliminate spilling if you are operating over exceptionally rough surfaces . . . but it does minimize the loss and enable you to RETAIN more.

This is just one more reason why these new "PAYLOADER" tractor-shovels are more productive and why the combination of all the features which only Hough-designed units offer the user make "PAYLOADER" a better buy than any other equipment.

If you are not familiar with these new models your "PAYLOADER" distributor will be glad to demonstrate them to you.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

11-8-1b

you DELIVER more

with NO STOP for shifts

. . . which the "complete" power-shift transmission of these "PAYLOADER" units provides by saving time and effort.

There is no need to bring HOUGH tractor-shovels to a stop for a "range" shift. All shifts in both forward and reverse can be made "on the go".

When you travel over muddy or slippery terrain, "power-transfer" differentials automatically transfer more power to the wheels with the best footing. This is another STANDARD on all four-wheel-drive "PAYLOADER" tractor-shovels.

Therefore, if you GET more at the start, if you SPILL less during travel, if you can travel faster with NO STOPS for shifting and better traction . . . you are going to be able to ***deliver*** MORE . . . and, after all, that's what counts.

Only "PAYLOADER" tractor-shovels have all of these PRODUCTIVE features which spell more PROFITABLE operations for the user.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

11-B-1c

you GET more

with GREATER choice

. . . of any and all kinds of financing.

What best fits your needs?

Do you want to purchase on a ***time payment*** plan? Your "PAYLOADER" distributor can offer you such a plan tailored to various periods to suit your needs.

Do you want a ***leasing plan**** with an ***option to purchase?*** He has a number of these which can be adapted to fit your requirements and preferences.

Do you want a straight ***leasing plan**** without a purchase option? He can provide "PAYLOADER" equipment for your operations on a straight leasing plan.*

Your distributor of "PAYLOADER" machines now has at his disposal the broadest and most complete set of financing plans and arrangements being offered.

He will be glad to discuss your needs for the finest equipment and offer you the greatest choice of terms. He will consider trade-ins.

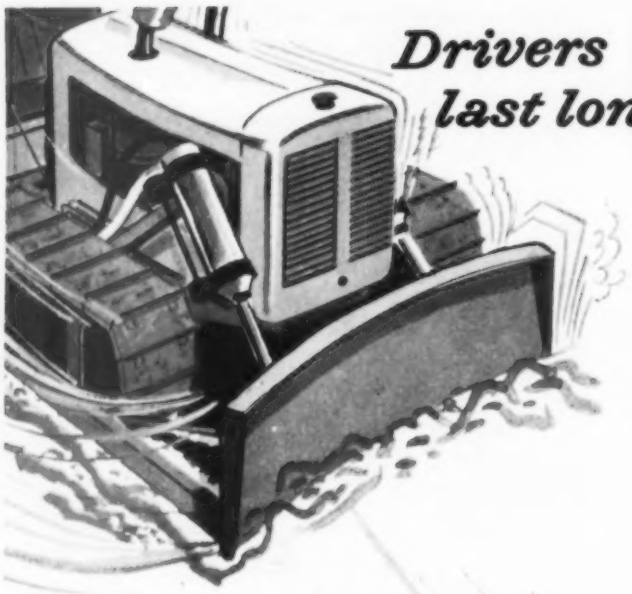
He'll even take cash!

Consult him at once.

*(available in the continental U.S.A.)

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

11-B-1d



Drivers last longer...

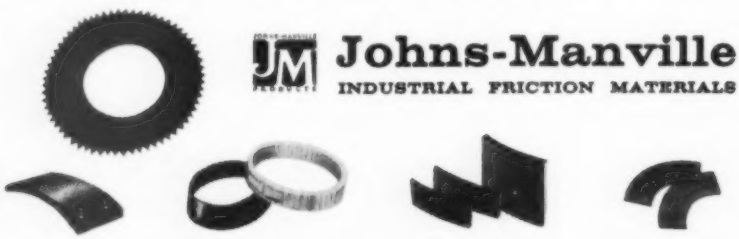
when heavy-duty machines use J-M Industrial Frictions

Johns-Manville Friction Materials deliver the safe, dependable performance that frees your drivers from worry about personal danger. And remember, it's much easier to replace linings than good operators. You get more out of your equipment, too, in terms of working time and "pay loads" handled.

That's because these rugged, durable facings and blocks are engineered for the job . . . and designed for outstanding performance plus maximum service life on trucks, shovels and heavy machinery.

Johns-Manville makes a wide range of industrial friction materials such as linings, facings, cones and segments that are "original parts" on many famous makes of heavy-duty units. For fast, easy replacement, they are available in Johns-Manville Assembled Sets that assure greatest safety in your equipment.

See your Johns-Manville Distributor for data on J-M Brake Linings and Clutch Facings for industrial equipment, or write Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario. Ask for booklet FM-35A.



Johns-Manville
INDUSTRIAL FRICTION MATERIALS

GEORGE P. TOWLE, formerly executive vice-president and general manager of the Sturtevant Mill Company, Dorchester, Mass., has been named president of the company, succeeding WILLIAM T. DOYLE, who becomes chairman of the board. CLAYTON F. ENGLISH, formerly production manager for the company, assumes the executive vice-presidential post.

WAYNE BURNSIDE has been appointed sales manager of Brunner & Lay, Inc., Franklin Park, Ill.

Formerly sales manager of Brunner & Lay Rock Bit, Philadelphia, Pa., Mr. Burnside comes to Franklin Park with extensive experience in sales and service of pneumatic accessory tools and carbide drill bits.

W. Burnside

W. T. Bess Jr.

WILLIAM T. BESS JR. has been named assistant to the president of the Union Bag - Camp Paper Bag Corporation, New York, N. Y.

Mr. Bess, a member of the Union organization since 1950, has served most recently as assistant director of multiwall bag sales.

The election of WILLIAM C. DENISON as a vice-president of the American Brake Shoe Company, New York, N. Y., and his appointment to the Operations Policy Committee was announced recently. Mr. Denison is also president of Brake Shoe's Denison Engineering Division.

H. C. WALLACE, assistant regional sales manager of the Southern Region of the Air Reduction Sales Company, New York, N. Y., has been named regional sales manager of that region, succeeding M. G. Wicker, who has resigned.

Mr. Wallace joined Air Reduction in 1929 at the Louisville, Ky., office, and has progressed through various sales positions over the years.

Allis-Chalmers HD-6
63 belt hp
up to 15,500-lb drawbar pull
forward speeds from 1.5 to 5.5 mph
reverse to 4.1 mph
15,850-lb (approx. as illustrated)

MORE DRAWBAR PULL . . . BETTER DOZING SPEEDS EASIER HANDLING . . .

. . . *than anything near its size*

More drawbar pull for extra output . . . up to 44 percent more drawbar pull enables the HD-6 to handle tougher jobs — bigger loads than other crawler tractors in its size.

Better dozing speeds . . . five forward speeds — including a 1.5 dozing gear as standard equipment — provide the right combination of power and speed for better dozing and higher production.

Easier handling . . . owners and operators of an HD-6 like its easy-to-reach controls, low lever pull clutches, direct electric starting and convenient rotary-valve dozer control.

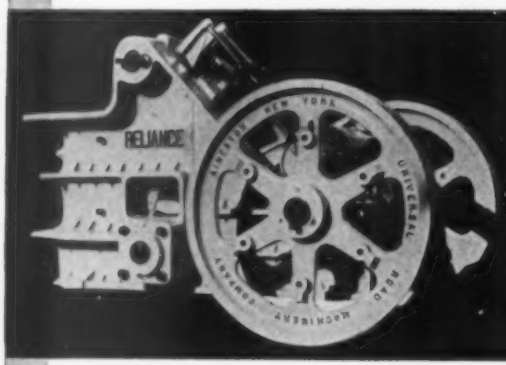
Ask your Allis-Chalmers construction machinery dealer to demonstrate the HD-6 on your job. You'll agree that the HD-6 is the best tractor-dozer in its size. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

ROCK CRUSHERS

LEVER-TYPE JAW CRUSHER STILL IN USE AFTER 36 YEARS

—at Keystone, So. Dakota



You, too, will do better with a HEAVY-DUTY

RELIANCE

lever-type crusher

- Greater weight, more stability—you save money on upkeep.
- Minimum abrasion—outlasts other designs 3 and 4 to 1.
- Long jaw plates—adjustable for all fineness ranges.
- Crushing, screening and washing plants—50 to 1,500 tons-per-day capacity—engineered to your needs.

Booklet on request, pictures installations

UNIVERSAL ROAD MACHINERY CO.

Main office and factory: Kingston, N. Y.

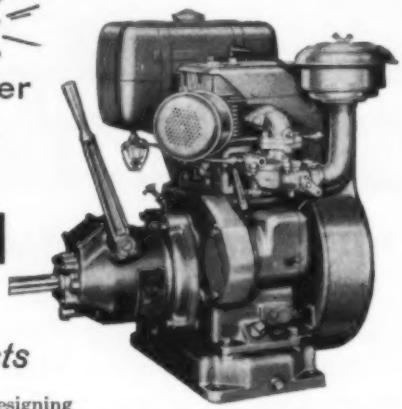
New York City office: 117 Liberty St.

a BIG NEW 4-cycle, single cylinder air-cooled engine the

WISCONSIN

12½ hp Model AGN

... by Engine Specialists



Model AGN Engine with Clutch Assembly. Also available with stub shaft or with Reduction, Clutch Reduction and/or Electric Starting.

Backed by an exclusive engine designing and production background dating from 1909, plus today's most advanced engineering knowledge and technique, this new engine is destined to become another BIG winner!

Putting 12½ hp. into a single cylinder air-cooled engine calls for basic *High Torque* . . . the *load-holding Lugging Power* that keeps the equipment *working* through sudden shock loads. It also calls for heavy-duty construction in all details . . . plus dependable cooling under all weather conditions from sub-zero to 140° F.

Bulletin S-216, just off the press, will give you details about the Model AGN. Write for it.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A7-6134-½A2

Appointment of JOHN J. SHAND as southern district manager for the complete line of Gar Wood—St. Paul truck equipment has been announced by Gar Wood Industries, Inc., Wayne, Mich.

Mr. Shand was formerly associated with the Industrial Truck Division of Clark Equipment Company as southeast regional sales manager. Previous to joining Clark Equipment, he was associated with Ford Motor Company, Truck division.

J. J. Shand

T. A. Haller

Directors of J. I. Case Company, Racine, Wis., have elected T. A. HALLER to the newly-created position of vice-president in charge of engineering. Mr. Haller will head up the new Case Research and Development Center in Racine, and will have overall supervision of engineering for both the Agricultural and Industrial Divisions.

Mr. Haller has been director of Engineering for the Industrial Division since Case merged with American Tractor Corporation earlier this year. Prior to joining American Tractor in a similar capacity, he was chief development engineer of the Construction Machinery Division of Allis-Chalmers Mfg. Co.

Several personnel changes were recently announced by Fairbanks, Morse & Company, Chicago, Ill.

PAGE S. PROCTER, who has for many years been manager of the company's New Orleans Branch, is retiring, effective January 1, 1958.

W. F. WAHLENMAIER, formerly manager of the company's Portland Branch, is taking over the post vacated by Mr. Procter.

MILO C. ROY, for the last 8 years affiliated with the Chicago Sales and Service Branch, is being transferred to the Portland Branch succeeding Mr. Wahlenmaier.

W. B. MORSE, assistant to the manager of the Chicago Branch, has been promoted to manager of that branch.

B. D. Bennett

Announcement has been made of the appointment of MYRON E. CAPOUCH as assistant general manager of sales of the American Steel and Wire Division, United States Steel Corporation, Cleveland, Ohio. BRUCE D. BENNETT succeeds Mr. Capouch as manager—construction material product sales.

Mr. Capouch has held a succession of sales assignments with American Steel & Wire. Joining the firm as a salesman, he subsequently served as assistant manager of the wire rope and construction materials department in the Chicago district office and as assistant manager of that division at the Cleveland headquarters. In 1950 he was named manager—construction materials products sales, the post he relinquishes to Mr. Bennett.

Mr. Bennett was a wire rope salesman in the Chicago sales offices from 1938 to 1943, when he was named to head the Wilkes-Barre, Pa., sales section as manager of sales. In 1947 he was made manager—wire rope and construction materials products in the Chicago Office.

EDWARD J. BYRNES JR., assistant general manager of sales, Eastern Division of The Colorado Fuel and Iron Corporation, died last month at the Palmer Spring plant of CF&I in Palmer, Mass.

Mr. Byrnes started his career in 1925 as an administrative assistant in the Springs and Formed Wire Department of the Wickwire Spencer Steel Company which later merged with CF&I. He later became assistant product manager, then product sales manager of the department.

Hugh D. Kelley, formerly production manager of the J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kans., has been named manager of the company's newly-established Passenger and Freight Elevator Division.

Directors of the Waukesha Motor Company, Waukesha, Wis., have elected the following new officers: Charles E. Nelson Jr., executive vice-president; J. Grant Swain, vice-president of sales; Newton H. Willis, vice-president of engineering; and Lewis W. Youker, secretary and treasurer.

The ULTIMATE in Scaling Efficiency

•

for

WEIGHING
BLENDING
FEEDING
MIXING
RECORDING
PROPORTIONING

SCHAFFER POIDOMETERS

are considered the "last word" in performance by informed processors of raw and finished materials.

This reputation is based on the proven superiority of Poidometers in handling all scaling jobs with utmost speed and accuracy.

You can't match these automatically-operating units for serviceability and economy, and they are vital factors in keeping production levels high.

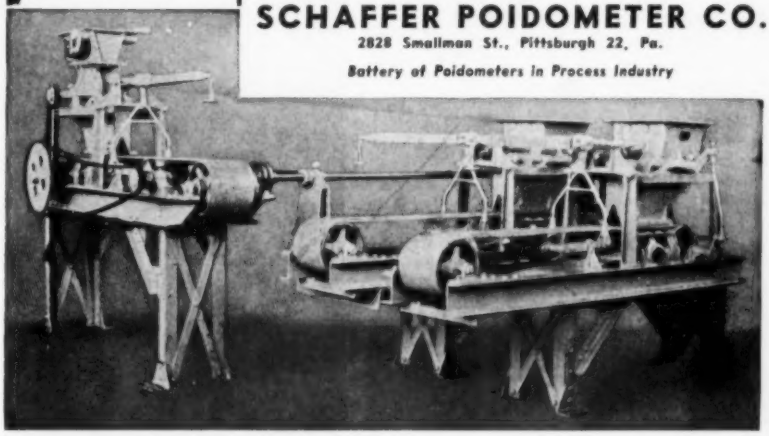
Available with remote controls for showing and changing feed rate, and with total weight recorders.

OVER 1500 NOW SERVING INDUSTRY

Write for Catalog No. 5

SCHAFFER POIDOMETER CO.

2828 Smallman St., Pittsburgh 22, Pa.



Battery of Poidometers in Process Industry

Neff & Fry Silo used for calcined coke

Many of our silos are currently being erected for handling and storing calcined coke. Scores of them have been in use for the same purpose over the years. The photograph shows one such installation in Pennsylvania. It is 24 ft. dia. x 60 ft. high.

There are a number of special problems in designing systems for handling calcined coke and other materials of similar consistency. Our knowledge of the subject can be of great practical value. We'll be glad to communicate or confer with you.

Our silos are constructed of Super-Concrete Staves with diagonal ends which permit steel hoops to impinge directly upon the horizontal joints. As many intervening hoops are installed as needed to met the lateral thrust of the contents. This is clearly explained in our folder, "Bins With the Strength of Pillars." A copy is yours for the asking.

Not exported except to Canada and Mexico.

SUPER-CONCRETE STAVE STORAGE BINS

THE NEFF & FRY CO.

278 ELM ST., CAMDEN, OHIO

Allis-Chalmers announces... **Newly**

1

Gang-operated disconnect switch isolates starter from incoming power — assures safe entry of high voltage compartments.

2

Steel cubicle is compartmentalized — separates high and low voltage equipment.

3

Short-circuit protection is provided by fast-acting current-limiting fuses, rated 150,000 kva at 2300 volts and 250,000 kva at 4160 or 4600 volts.

4

Overload protection is handled by accurate relays which trip only on excessive motor current, preventing needless motor stoppages.

5

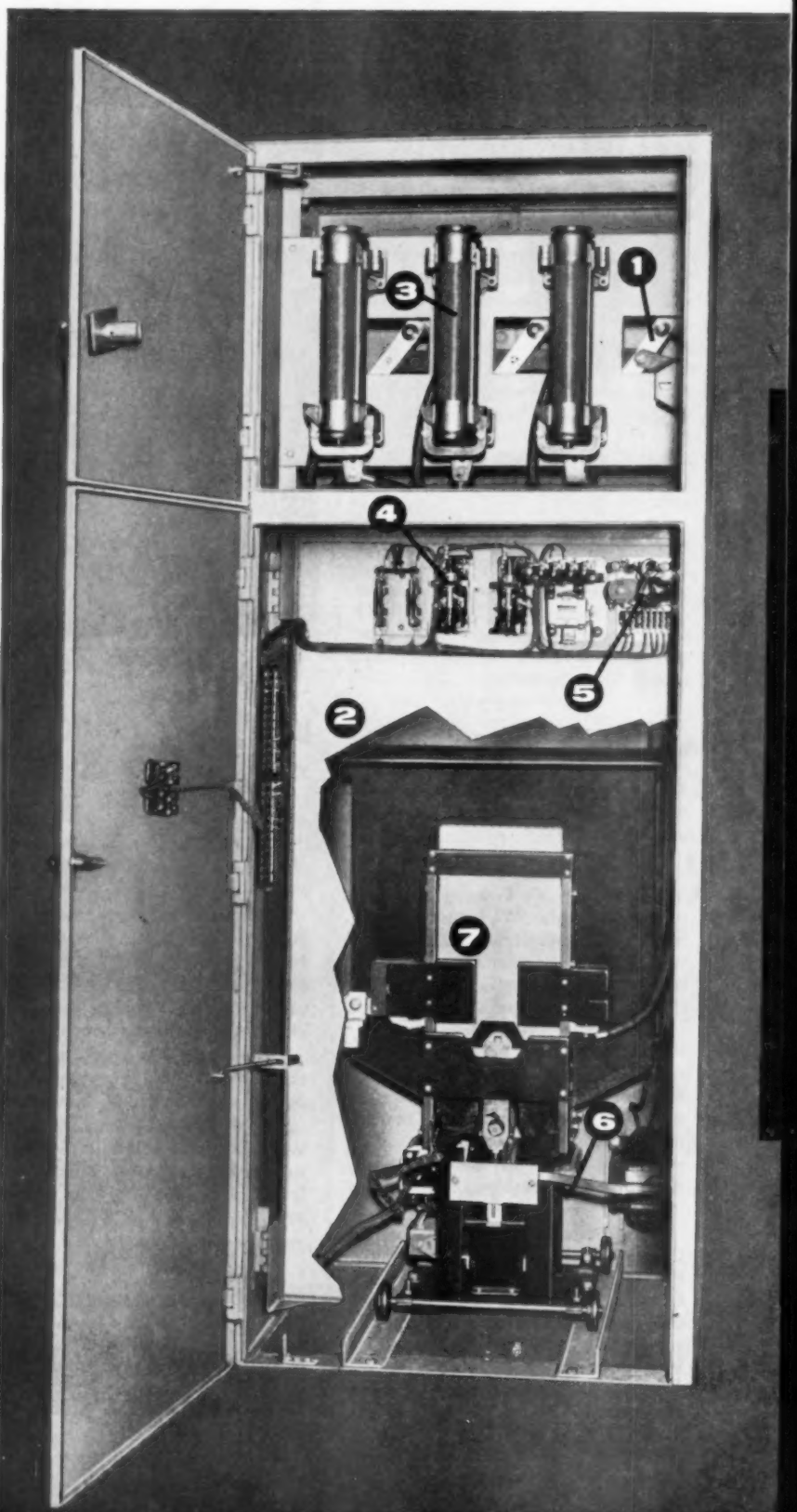
Undervoltage protection instantaneously opens line contactor on loss of voltage. Time-delay undervoltage protection also available.

6

Mechanical interlock coordinates contactor, disconnect switch, upper door and inner control barrier for maximum safety.

7

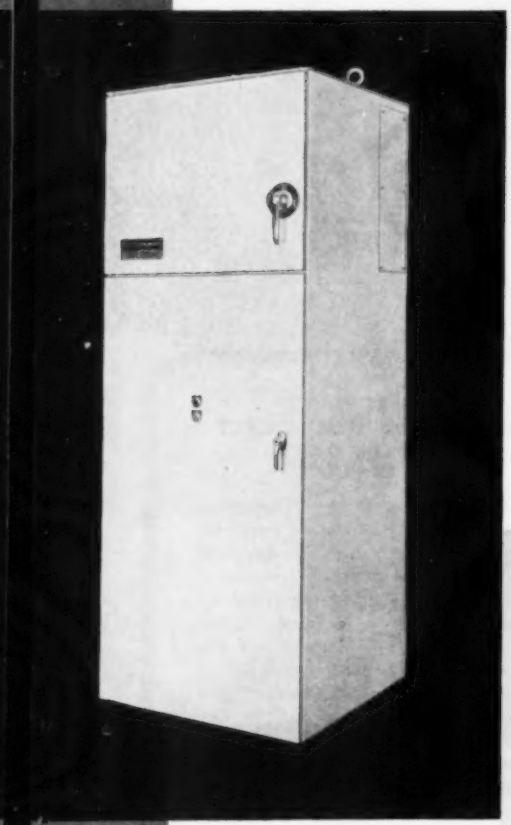
Roll-out contactor makes maintenance easy—even in narrowest aisle space. (Routine inspection and maintenance can be done with contactor in place.)



Designed

Type H High Voltage Motor Control

Combines front access with space economy...



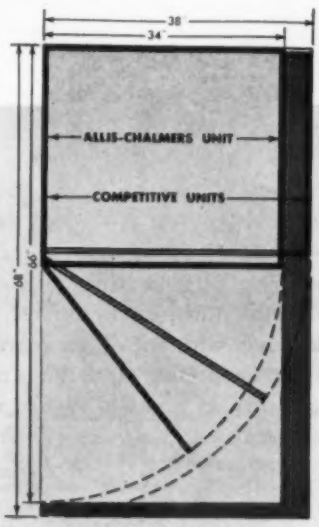
In addition, you get maximum protection for personnel and machines, thoroughly tested components, and ample panel space for modifications. It's all built into the *smaller cabinet* of a newly designed line of Type H high voltage starters from Allis-Chalmers.

Here is control that couples compactness with roominess (for ease of maintenance) . . . here is a starter that joins test-proven performance with versatility (for addition of meters and relays) — AND the line meets every 2300 to 5000-volt motor need.

For more information on this engineering advance, contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS UNIT requires 2.3 sq ft *less* floor space than any competitive unit. Put 10 A-C units in the same area needed for 9 cabinets of other manufacture.

Indicates 2.3-sq-ft saving in floor space



ALLIS-CHALMERS

A-C ALLIS CHALMERS

A-5517

435 386 390 143 396 445 496 495 545 546 595 446

VISIT WITH US AT THE CHEMICAL SHOW

Booth **446,** *Second Floor*

NEW COLISEUM, NEW YORK

Once again, it will be a pleasure to welcome you in our booth at the Chemical Show . . . to talk over your problems on conveying, feeding, and cooling of dry pulverized and granular materials, and your requirements on air compressors and vacuum pumps.

Sales engineers will be in attendance to discuss thoroughly any problems you may have, on which we might be of some assistance to you.

If you are presently handling dry pulverized or granular materials into, through, or out of, your plant, stop in and talk it over with one of our representatives . . . get the full story on harnessing air to move materials. It may well pay you plenty in terms of higher, sustained production at reduced cost.

G-174
4387

EQUIPMENT DESIGNED AND BUILT *by* FULLER

Fuller-Kinyon, Fuller-Fluxo, Airveyor® and F-H Airslide® conveying systems • Fuller Airmerge Blending System • Fuller Rotary Compressors and Vacuum Pumps • Sutorbilt Rotary Positive-Pressure Blowers . . . Gas Pumps . . . Vacuum Pumps • Fuller Preheater—Humboldt Suspension Type • Fuller Inclined-Grate Cooler • Fuller Horizontal-Grate Cooler • Fuller Dry Pulverized-Material Cooler • Fuller Rotary Feeders and Rotary Valves • Material-Level Indicators • Lehigh Induced-Draft Fans • Motion Safety Switch • Aeration Units • Slurry Valves

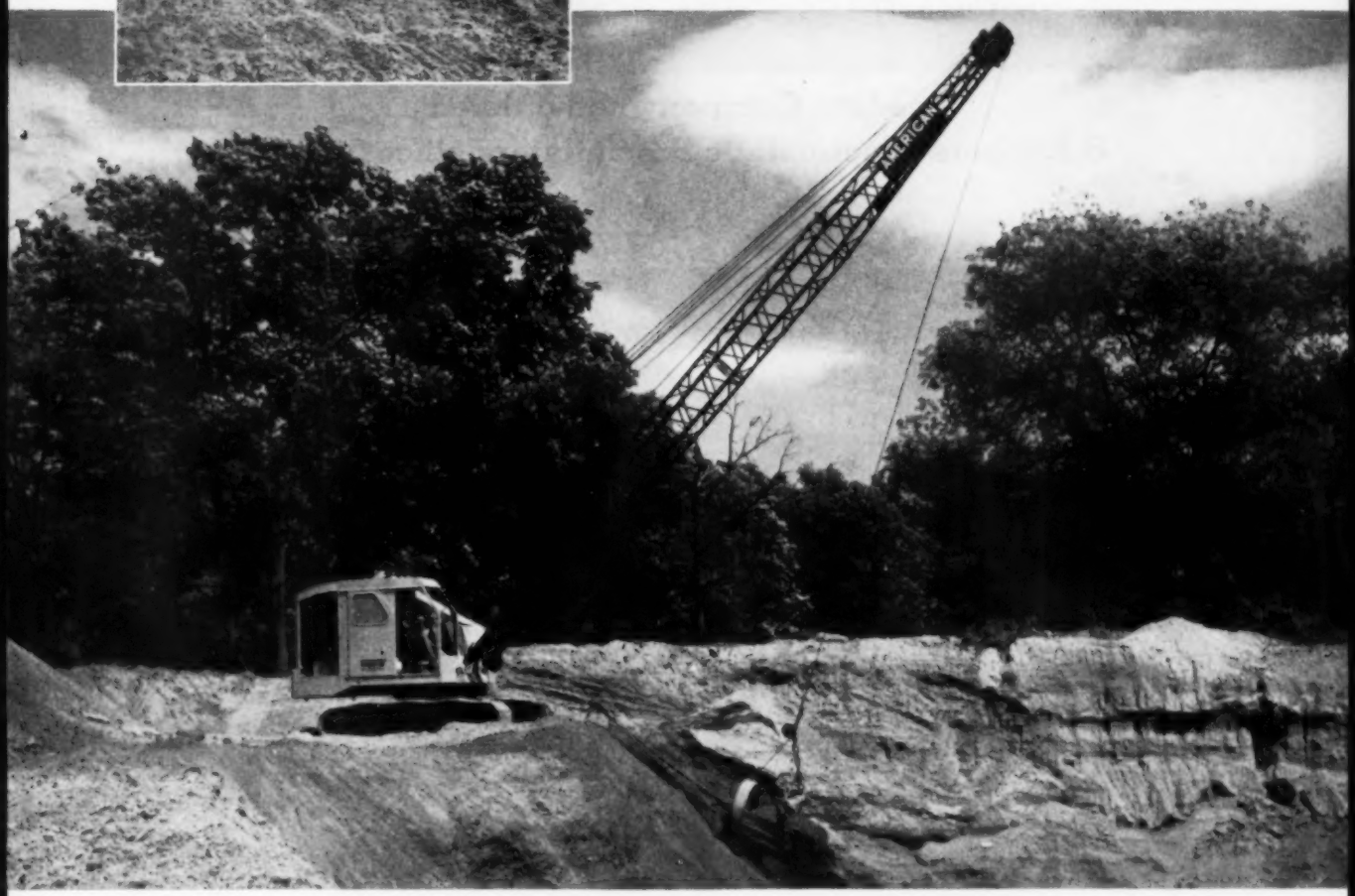
FULLER COMPANY
GENERAL AMERICAN

Fuller
. . . . . pioneers in harnessing AIR

FULLER COMPANY
100 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham • Chicago • Kansas City • Los Angeles • San Francisco • Seattle

16 YEARS ON THE JOB PROVES AMERICAN DURABILITY

Sixteen year old dragline, left, was Howard Arnold Company's first American. Last year the firm added American's latest 300 Series Dragline, shown below. A decade and a half of trouble-free performance proved to the owner that the rugged design of American Cranes pays off!



Howard Arnold worked a tough American Dragline in his sand and gravel pits for 15 years. He had so little trouble that last year he bought a second American. He says, "The performance of our first American was the chief reason for buying the new one. It was bought in 1941 and is still running perfectly. Until recently we hadn't made any major repairs on it. We still keep it busy at our other pit."

About his new American 300 Series Dragline, Arnold says, "This machine let us revise our operations to the extent that we can handle material faster and get more thorough coverage of the pit. The longer boom helps, and the American handles it very well." Equipped with one-yard buckets, Arnold's Americans work in the pit, feed crushers and load trucks from stockpiles.

Successful performance reports of American Cranes on the job, like this one of the Howard Arnold Company of Fairbury, Ill., are typical! Find out for yourself . . . talk to owners and operators — watch American Cranes *at work!* Ask your nearest distributor to show you American Crawler and Truck Cranes on the job. With any front — dragline, shovel, clamshell, backhoe or crane boom — in any capacity from ½-yard, 12½ tons on up, you'll see, in person, why American is the fastest growing line in the country!

AMERICAN HOIST
and Derrick Company

Saint Paul 7, Minnesota

GAS CLEANING NEWS

Top Cement Producer Orders Four More Koppers Electrostatic Precipitators for Gas Cleaning

Leading Company has ordered 8 Koppers Electrostatic Precipitators since 1950

KOPPERS Electrostatic Precipitators have provided such excellent service that this leading cement producer ordered seven additional Koppers units during the last six years.

Proves Performance on the Job

The company ordered its first Koppers Electrostatic Precipitator in 1950. Its operation was so successful that Koppers Units now collect dust in both East Coast and Gulf Coast plants. These Koppers units have proved economical and efficient because Koppers engineers were able to meet the exacting requirements of each application.

Supplies a Wide Range

These Koppers Electrostatic Precipitators range in capacity from 75,000 CFM to 132,000 CFM. And each Koppers unit has exceeded its guaranteed performance. Engineering know-how enables Koppers to economically satisfy each individual application.

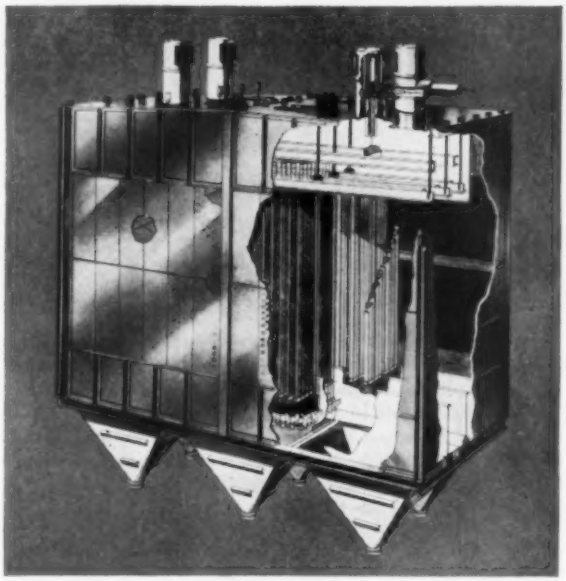
Meets Individual Plant Needs

Koppers custom-designs Electrostatic Precipitators for cement and other dry dust applications: cleaning rotary or vertical kilns, calcining kettle stack gas, collecting dust for re-use, cleaning gases from finishing and raw mill operations. Koppers tailors a power unit by one of three methods to fit specific needs and can also integrate an automatic power regulator into the overall design.

Backed by Know-How

Koppers has over 75 years' experience in industrial gas cleaning. In addition, Koppers maintains extensive research facilities at Verona, Pa., and Baltimore, Md. Manufacturing facilities at Baltimore produce gas cleaning equipment for every size and type of plant.

You can put all of this experience and equipment to work solving your gas cleaning problems. Just write KOPPERS COMPANY, INC., Metal Products Division, Industrial Gas Cleaning Dept., 4511 Scott Street, Baltimore 3, Maryland.



Cutaway photo of a Koppers Electrostatic Precipitator shows shell, vibrators, and collecting and discharge electrodes. The actual design and arrangement of elements vary widely because Koppers Electrostatic Precipitators are custom-designed to fit requirements of each particular installation.

WHYTE STRAND WIRE ROPE

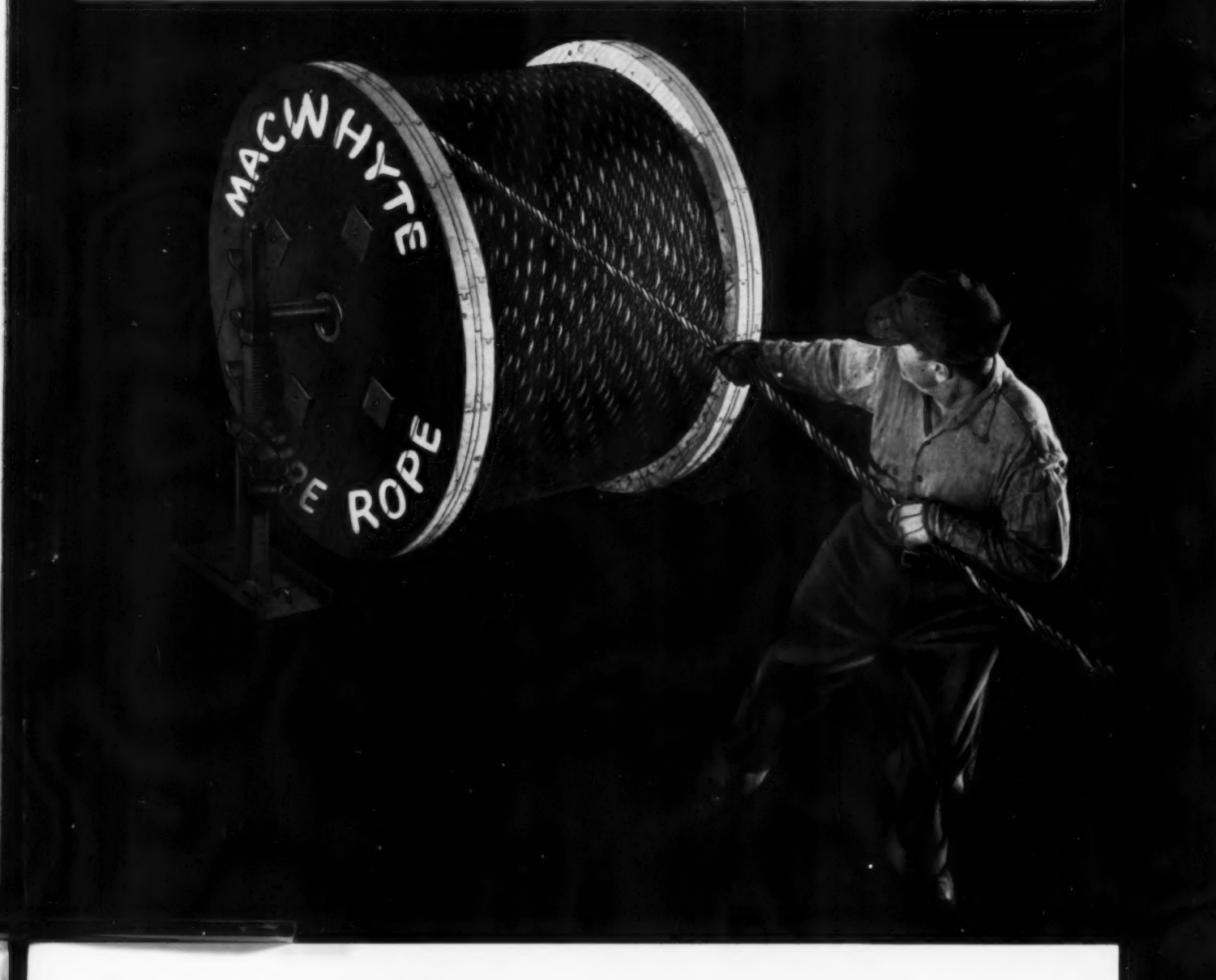
1000 & 1 Macwhyte Wire Ropes serve your equipment the sure, dependable way

WHYTE STRAND by Macwhyte is designed to meet your every requirement. It is PREformed for flexibility, and internally lubricated for outstanding service in any operation. Macwhyte Wire Rope is in stock for immediate delivery. Ask for Catalog G-16 and recommendations for the correct wire rope for your equipment.

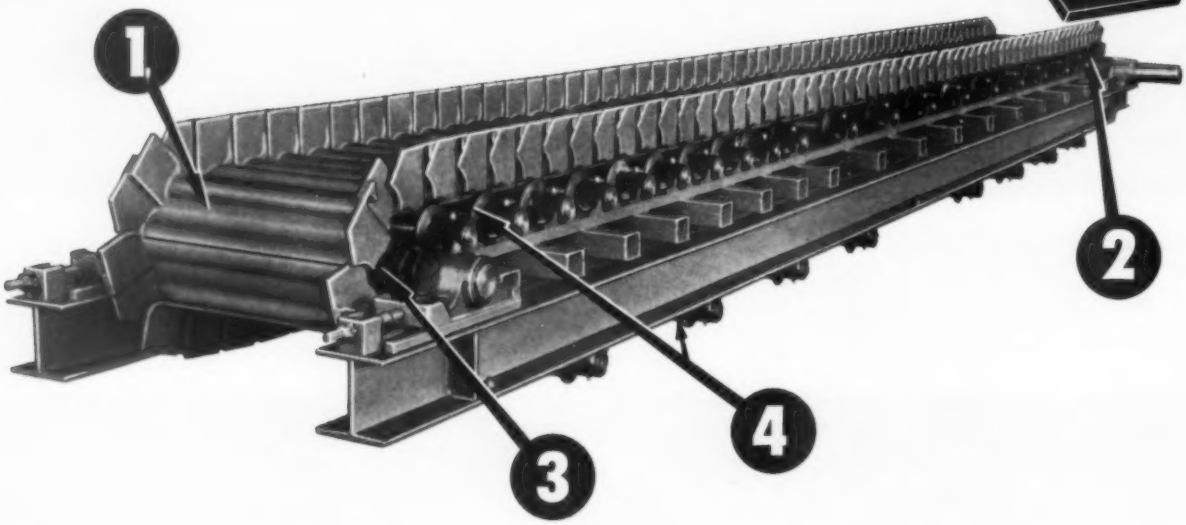
MACWHYTE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel and Plastic Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: **New York 4,** 35 Water St. • **Pittsburgh 36,** 353 Old Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P.O. Box 605 • **Portland 9,** 1603 N.W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 21,** 2035 Sacramento St.

1116



WHERE WEAR COUNTS!



TISCO® PAN FEEDERS

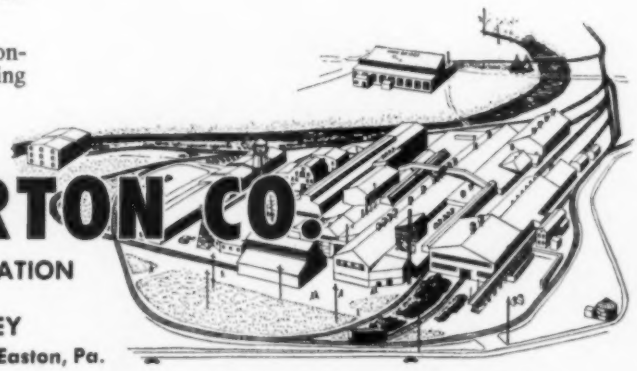
❶ **FEEDER PANS** — Hammered by tons of heavy rocks and ore every minute, but tough TISCO Manganese Chrome Steel pans lick impact and abrasion, outwear ordinary pan feeders 5 to 1.

❷ **HEAD SPROCKETS** — One break-down here flattens production. For dependable durability Manganese Steel does the job.

❸ **IDLERS** — Manganese Steel in this vital part keeps idlers busy, smooth running.

❹ **ROLLERS** — When each roller must continually shake off shocks and abrasion nothing wears like Manganese Steel.

Picture tons of heavy, abrasive material smashing down on this TAYLOR-WHARTON Pan Feeder, month after month without a breakdown. The reason — tough TISCO Manganese Steel soaks up shock and abrasion, keeps production climbing, maintenance down. For further information write to:



TAYLOR-WHARTON CO.

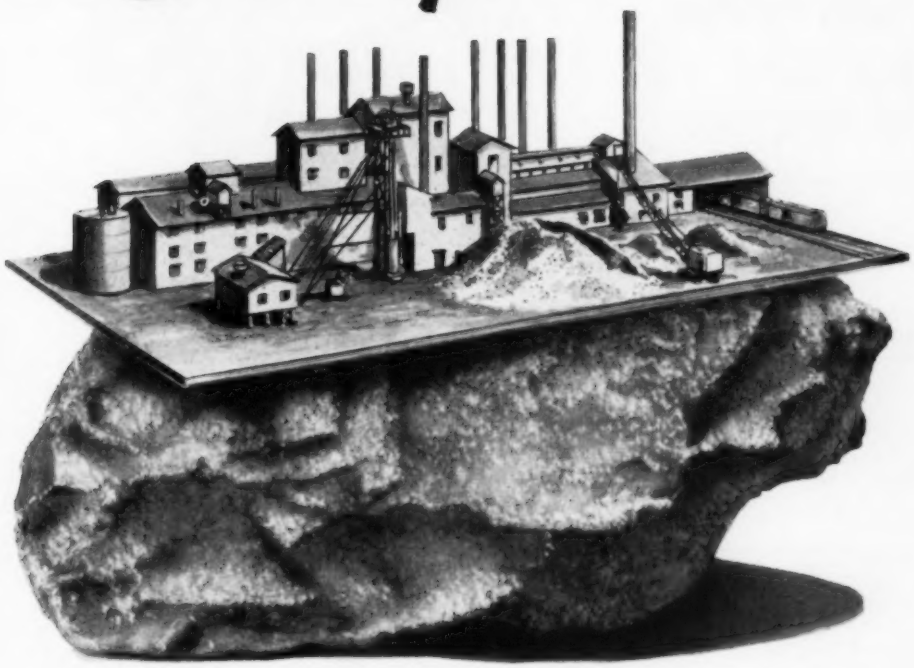
DIVISION OF HARSCO CORPORATION

Established 1742

HIGH BRIDGE 3, NEW JERSEY

Cincinnati, O. — Birmingham, Ala. — Easton, Pa.

Sitting Pretty!

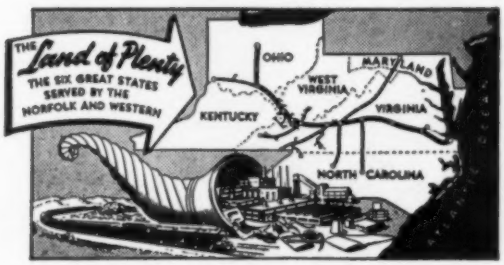


On top of all the LIMESTONE you'll ever need . . .

Limestone as you like it — 97.8% calcium carbonate, in mineable thicknesses of over 100 feet, and more than 100 million tons in one location, alone. If you need new limestone sources — high calcium or dolomitic — The Land of Plenty is the place for you.

You virtually can put your new plant on top of this vast resource with the assurance of an abundant supply of underground and surface water . . . home-rooted, high production manpower . . . and strategic location in the middle of a great domestic market.

Let the Norfolk and Western's plant location specialists give you full details — in confidence and without obligation — on the fine industrial sites on top of all the limestone you'll ever need.

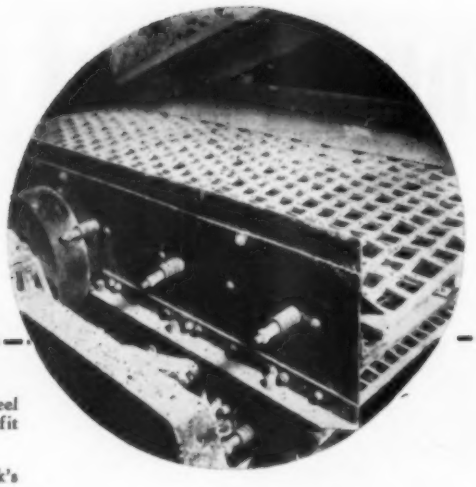


Write, wire or call —

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer PQ-780 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

HENDRICK PERFORATED PLATE PAYS OFF!



Here's how Hendrick H Quality Perforated Steel Plate can often mean the difference between profit and loss for your screening operations:

* Hendrick H Quality Steel comes from Hendrick's wide experience in selecting and specifying the best analysis of steel for the aggregates industry

* Hendrick H Quality Perforated Plate is available in high carbon steel, heat-treated after perforating for longer life

* Product uniformity is assured by uniformity of mesh throughout life of the screen

* Full clearance of Hendrick H Quality Plate practically eliminates blinding

* Faster deck changes . . . lower labor cost

* Large open area assures maximum protection

Hendrick MANUFACTURING COMPANY

39 DUNDAFF STREET • CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

Owatonna Aggregates officials E. W. Hammel and son, Donald Hammel, at their plant in Owatonna, Minn.

THE PROCESS . . .
Sand, gravel, and aggregate production from a marginal-grade glacial deposit

THE USER . . .
Owatonna Aggregates Corporation, Owatonna, Minn.

THE EQUIPMENT . . .
Wemco Sand Preparation Machine, Memco Mobil-Mill, Wemco Remer Jig

THE RESULTS . . .
With installation of Wemco equipment, this plant is now an efficient producer of large tonnages, able to meet increasingly tight state specifications, in all size ranges, even though deposit is of poor quality.

WEMCO®

WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California
Representatives in all principal cities.

H&L

Teeth that really dig!

Pat. No. 2,568,075
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H&L TOOTH COMPANY

1540 South Greenwood Avenue Montebello, California

SINCE 1885—GRUENDLER QUALITY, BEST MONEY CAN BUY

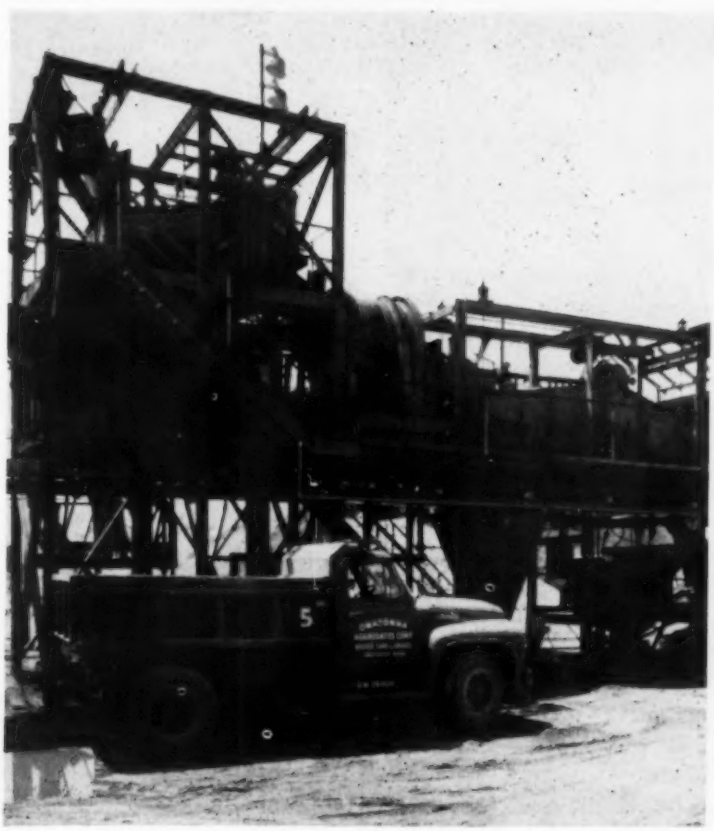
Gruendler Stationary Quarry Plants

Equipment includes Primary Jaw or Impact Crusher and Apron Feeder,—Conveyor to Screen,—Vibrating or Revolving Screen,—Secondary Rolls, Hammermill or Jaw Crusher.—Return Conveyor to Main Conveyor and Steel Bins for various size aggregates, with all drives and chutes. Gruendler dependable Plants are sturdier in construction with long experience behind them for most economical operation. Complete equipment available for your plant to produce upwards to 3000 tons daily if desired.

Write for our Bulletin: ROCK and GRAVEL OPERATION

GRUENDLER CRUSHER & PULVERIZER CO.

Dept. PQ-11 2915 N. Market St. St. Louis 6, Mo. U. S. A.



THE PRODUCT...
Wemco Mobil-Mill for Heavy Media Separation

THE USER...
Owatonna Aggregates Corporation, Owatonna, Minn.

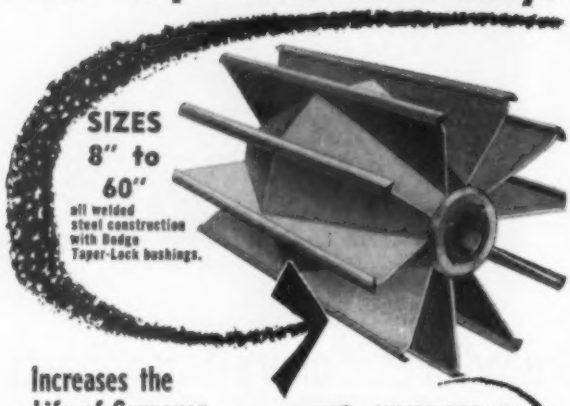
THE RESULTS...
In an area of high shale content, the installation of a Wemco Mobil-Mill HMS plant has enabled the operators to beneficiate their gravel to meet high state specifications for concrete. Sale of the light weight product pays for the HMS operation.

WEMCO®

WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California
Representatives in all principal cities.

A Sure Way To Cut Operation Costs!

Van Gorp Belt Saver Pulleys



SIZES 8" to 60"
all welded steel construction with Dodge Taper-Lock bushings.

Increases the Life of Conveyor and Elevator Belts.
Self cleaning cone design prevents any material bulid-up between the belt and pulley.

WRITE TODAY!
for complete information, catalog and specifications

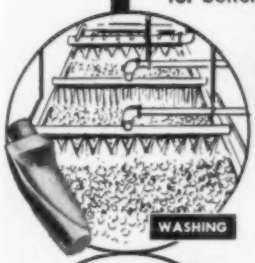
Van Gorp Mfg. Inc.

BOX 123 • PELLA, IOWA • Phone MAfair 8-2140

for better washing . . . dust control . . . concrete curing

SPRAY NOZZLES

from Spraying Systems Co.



- **complete choice of types and capacities to fit your job**
- **greater efficiency with minimum volume of water**

Proper distribution and impact for washing . . . or proper atomization for dust control and concrete curing without unnecessary wetting . . . these are just some of the advantages of having a complete choice of spray nozzle types and sizes to fit your job. For complete information write for Catalog 24.

SPRAYING SYSTEMS CO.
3224 RANDOLPH STREET
BELLWOOD, ILLINOIS

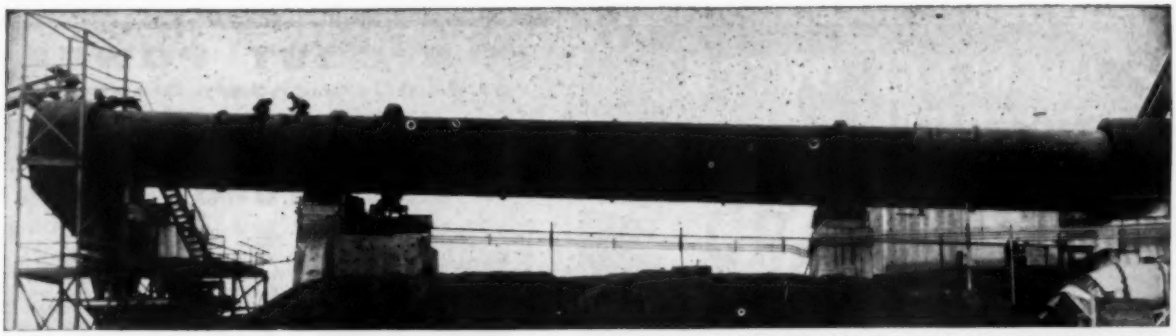
THE PRODUCT...
Wemco Remer Jig

THE USER...
Owatonna Aggregates Corporation, Owatonna, Minn.

THE RESULTS...
Prior to installation of jig, shale content of sand was 3 to 3½%, and did not meet highway department specifications of a 2½% shale. Plant now processes 60 TPH with shale content down to ½% - ¾%.

WEMCO®

WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California
Representatives in all principal cities.



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We design and manufacture

ROTARY KILNS
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DRYERS
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COOLERS
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LIME HYDRATORS
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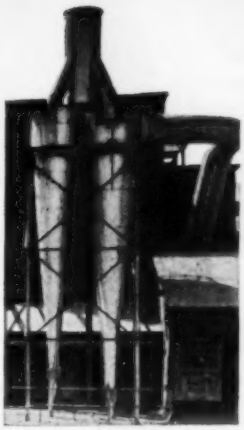
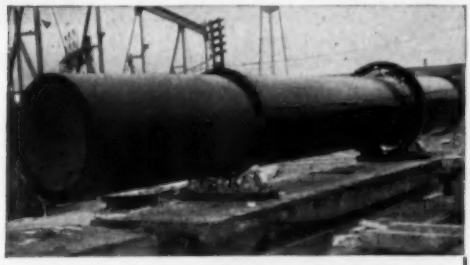
DUST COLLECTORS

Engineers & Contractors for Cement, Lime & Crushed Stone Plants



NEW HIGH EFFICIENCY DUST COLLECTOR



7'x60' CLAY DRYER INSTALLED IN HENDERSONVILLE, N. C.

W. P. HEINEKEN, INC.

ENGINEERS MANUFACTURERS

50 BROAD STREET • NEW YORK 4, N. Y.

THE PRODUCT...
Wemco Sand Preparation Machine

THE USER...
Owatonna Aggregates Corporation, Owatonna, Minn.

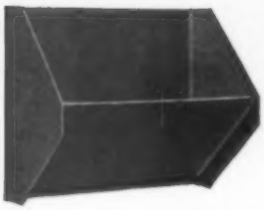
THE RESULTS...
This sand preparation installation washes and cleans 60 tons per hour of minus ⅛" feed, and produces specification sand of closely controlled quality with maximum retention of fines.

WEMCO®

WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California
Representatives in all principal cities.

INCREASE OUTPUT, REDUCE COSTS With STANDARD ELEVATING AND CONVEYING EQUIPMENT

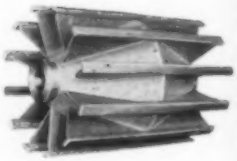
CONTINUOUS ELEVATOR BUCKET STYLE No. 2



This Standard Bucket provides outstanding service under severest operating conditions. It resists wear—assures longer bucket life and lower operating costs. This style of bucket is typical of the complete line of low-cost, rugged Standard Steel Buckets — available in Salem, Style "A," shelf type and other continuous style buckets.

STANDARD WING-TYPE SELF-CLEANING PULLEY

Specify Standard Wing-Type Self-Cleaning Pulleys when ordering pulleys for your operation. They provide these six cost-cutting advantages—all-steel welded construction . . . lower cost . . . less weight . . . greater strength . . . greater resistance to breaking . . . longer life.



STANDARD BIN GATE

Material handling costs less . . . is faster, easier and more efficient . . . with this Standard all-steel gear-operated Bin Gate. Other types of Standard Bin Gates also available.

SM2

Reduce maintenance and material handling costs by converting to Standard equipment. Write today for catalog showing complete Standard line.

The Standard Metal Mfg. Co. SINCE 1921

STANDARD METAL MFG. CO.
111 CENTER ST. MALINTA, OHIO

LOW COST POWER
For Fast "Secondary Breakage"

FREDERICK *CAST SEMI-STEEL* DROP BALLS

Tough, rugged Frederick Drop Balls give you crushing power where you want it, when you want it . . . cut down expensive drilling or blasting . . . give long, economical service with little or no maintenance. Exclusive "Pear shaped" design withstands greater impact—drops straighter. "E-Z Swing" recessed steel eye gives cable protection plus free swinging action. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Nickel alloy standard on all 4000 lbs. or over—or special alloys furnished on request. Balls can be furnished with replaceable pins. Special release hooks for free dropping also available.

Write us today for prices and illustrated literature. Order Balls direct or see your nearest Equipment Dealer.

	Wide Range of Sizes and Weights:						
Pear shape (lbs.)	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.)	500	1000	2000	5200			
Spherical shape (lbs.) (for magnet use)	470	950	1650	2400	3000	3700	5400

FREDERICK IRON & STEEL, INC.
FREDERICK *Established 1890* MARYLAND
Phone: MOnument 3-5111

CENTRIFUGAL PUMPS • MUNICIPAL AND GRAY IRON CASTINGS

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CON-EDISON GAS PRODUCING PLANT
HUNTS POINT AVE. BRONX, N. Y.

FOR SALE

- 4 Unloaders
- 9,000 ft. Conveyors
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- Boilers
- Compressors
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- Pipe (all sizes)
- Structural Steel
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RADMETALS CORP. Phone: TUrnbull 7-0950
or write **Radmetals, c/o Con-Ed, Hunts Pt.**

Auto-Vortex Classifiers are delivering sharp gradations and recovering fines . . . at lower operating costs . . . in hundreds of installations all over the country.

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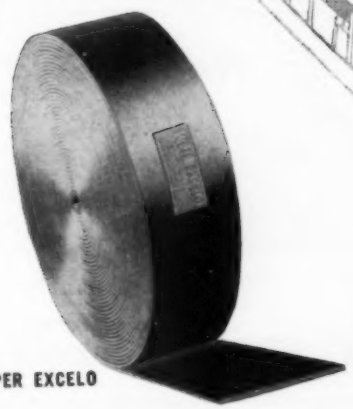
AUTO VORTEX CLASSIFIERS
906 N. WATER ST. • MILWAUKEE 2, WIS.

WE'D LIKE TO SOLVE *YOUR* CLASSIFICATION PROBLEMS. WRITE TODAY!

moving 3,000 tons OF 4" ROCK EVERY DAY

Installation at Gary Bros. Crushed Stone Co., Bowling Green, Ky.

everything new but the Republic Conveyor Belt



SUPER EXCELO

RECORD MAKER

Everything is new about this Southern crushing plant except the primary conveyor belt. In use since 1952, the Republic Record Maker Belt showed so little wear that it was installed as the Primary Crusher Belt in this new plant.

Through John Bouchard & Sons Co., Nashville, Tenn., the Republic Rubber Distributor who serviced them, the customer comments—"Best service we have ever had from any belt of any manufacture. We like the belt so well we will use this grade in another plant of ours."

For severe service conditions, Republic makes two grades of conveyor belting—Super Excelo and Record Maker. Super Excelo handles any type of sharp or highly abrasive material. Record Maker is recommended for moderately abrasive materials.

Write for Republic's complete catalog on Conveyor or Elevator Belting, or contact the Republic distributor nearest you. You will find his name under Rubber Products in the Yellow Pages of the telephone book.

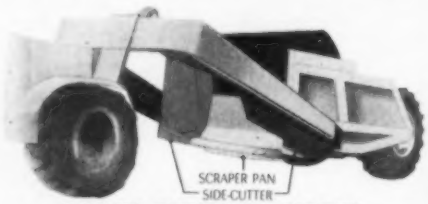
REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

Pans and side-cutters and other wear points repaired to last on the toughest grading jobs with

ADMIRO Heat Treated Alloy Steel



COMPLETE FABRICATING FACILITIES
Welding . . . Rolling . . . Forming
Intricate Shapes Cut to Specification

ADMIRO-armored scraper pans stand up best against the severe abrasion and heavy impact to which they are subjected. ADMIRO Heat Treated high tensile alloy steel is widely used in industry to provide longer equipment service life . . . etc. Reduce down-time, and lower maintenance and replacement costs. Available in bars and plates.

Recommended Applications: Wear liner plates, crushers, chutes, buckets, truck beds, dirt and rock recovery equipment. Special uses in Mining, Quarrying, Cement and Aggregate Plants.

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ADMIRAL ALLOY STEEL CORP., 850 Euclid Ave., Cleveland 14, Ohio

ADMIRAL ALLOY STEEL CORP. of Texas, 2802 Rector St., Dallas 15, Texas

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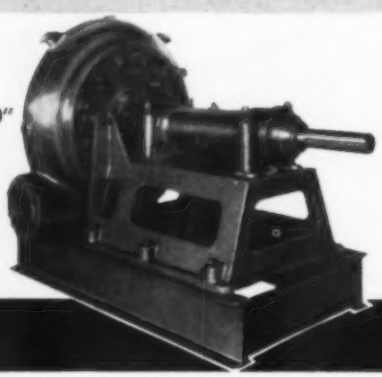
Model XL
Built in
6", 8" and 10"
sizes.
High Grade
Anti-Friction
Bearings
throughout.



Lightning DREDGE PUMP

For RIGIDITY while pump is in operation, shell is mounted direct to base by means of solid, one piece casting. For GREATER PRODUCTIVITY (10-15% higher solids output than comparable pumps), EASIER MAINTENANCE (impeller replaced in hours instead of days) and ECONOMY in first cost, replacement cost and operating cost look to LIGHTNING the complete line (3" to 10").

See your local distributor or write:

KANSAS CITY HAY PRESS CO.
Manufacturers of Heavy-Duty Lightning Sand and Gravel Pumps
801 WOODSWETHER ROAD • KANSAS CITY, MISSOURI

PLATEGRIP
PLATE FASTENERS FOR CONVEYOR BELTS

Makes strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1/2" thickness. *Write for Catalog Sheet.*

ARMSTRONG BRAY & CO.
5394 Northwest Highway, CHICAGO 30, U. S. A.

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TERRIFIC
Used Equipment
BARGAINS

See
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EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

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Contract Core Drill Division
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THOR PORTABLE POWER TOOLS

1500 tools for automotive service, industry, construction

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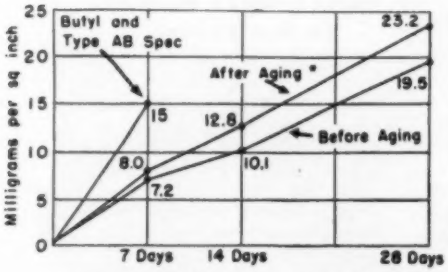
World's largest exclusive manufacturer of portable air and electric tools

THOR POWER TOOL COMPANY
Prudential Plaza, Chicago 1, Ill.
Branches in all principal cities

ANACONDA TYPE SH-D Shovel Cable with neoprene jacket, Type AB butyl insulation—a good companion in wet locations.

New champ in the "old swimming hole"

—Anaconda Type AB butyl-insulated Shovel Cable



RESULTS OF mechanical moisture absorption test show Type AB absorbs less than *half* the moisture Industry Specifications allow.

Where shovel cable is exposed to rain, snow or wet spots — moisture-resistant properties of the jacket *and insulation* are vitally important.

Latest test results show Anaconda Type AB butyl insulation (used in Anaconda Shovel Cable) *absorbs far less moisture* than the criterion set up by Industry Standards.

Result: longer cable life . . . greater freedom from failure . . . less down time for users of Anaconda Type AB-insulated Shovel Cable.

NEW ENGINEERING BULLETIN EB-27 has full details on performance of Anaconda butyl insulation in 15 Industry Specification tests. Ask the Man from Anaconda for your copy. And see your Anaconda distributor for your Shovel Cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 57319

SEE YOUR ANACONDA® DISTRIBUTOR FOR SHOVEL CABLE

"There is no finer engine than MURPHY DIESEL"

If you're looking for dependable power with maximum operating economy, it will pay you to profit by the experience of so many other pit and quarry operators who have found Murphy Diesel to be "the finest engine on the market."

Talk over your requirements for engines, power units or "packaged" generator sets with your Murphy Diesel Dealer. Ask him to show you how trouble-free Murphy Diesels can help you increase profits.

Sterling Sand and Gravel Co.

TELEPHONE PO 2-2202
1000 SOUTH TAFT HILL ROAD
FORT COLLINS, COLO.

SPECIFICATION CONCRETE MATERIALS

ASPHALT PAVING

April 23, 1957

Murphy Diesel Company
5317 W. Burnham Street
Milwaukee 14, Wisconsin

Gentlemen:

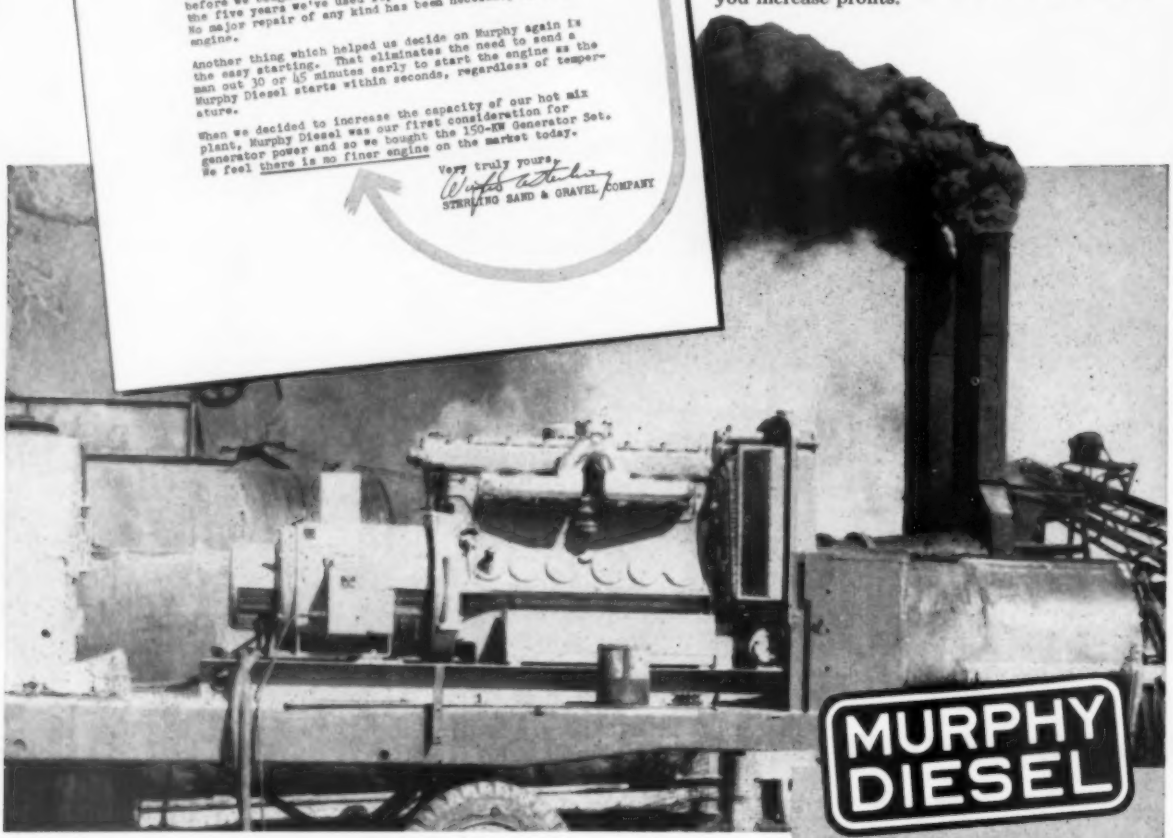
We have recently purchased one of your Model 12A 150 KW Generator Sets. From our previous experience with the economy and dependability of the Murphy Diesel Model 22-A we've been using for the past five years, we figured we couldn't find a better engine anyplace.

Our old Model 22-A, which is a 100-KW Generator Set, was purchased used in 1952. Hinman Bros. Construction Co., who originally purchased the set, had used it for three years before we bought it. It has given us excellent service in the five years we've used it, with very little maintenance. No major repair of any kind has been necessary on this engine.

Another thing which helped us decide on Murphy again is the easy starting. That eliminates the need to send a man out 30 or 45 minutes early to start the engine as the Murphy Diesel starts within seconds, regardless of temperature.

When we decided to increase the capacity of our hot mix plant, Murphy Diesel was our first consideration for generator power and so we bought the 150-KW Generator Set. We feel there is no finer engine on the market today.

Very truly yours,
STERLING SAND & GRAVEL COMPANY



HEAVY-DUTY POWER
for Rock Crushing

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY

5307 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

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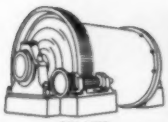
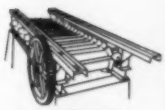
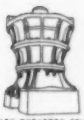


BALL MILLS

ROTARY KILNS



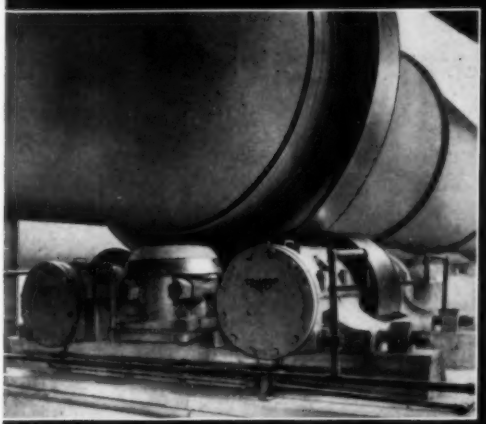
APRON FEEDERS



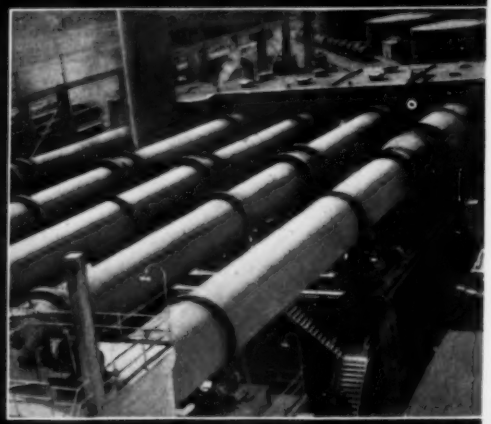
PRIMARY GYRATORY CRUSHERS

TRAYLOR-MADE

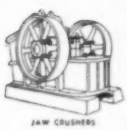
is engineering precision ✓



Thrust roller mechanism of an 8′—6″ diameter to 7′—10″ diameter x 400′—0″ Traylor Rotary Kiln.



13′—0″ diameter to 10′—0″ x 200′—0″ Traylor Rotary Kiln.



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Outstanding Traylor Roller Supports insures easy alignment, continuous operation and low maintenance of kilns, coolers, dryers and slakers. Hundreds of rotary kilns are being used in industry today reflecting the soundness of design and high standards of Traylor craftmanship. Traylor rotary kilns have all welded steel shells-feed and discharge end seals, heat recuperating chain systems for wet process kilns, improved kiln feeders, kiln controls, drives and many other important features. Write for bulletin #1115 today!

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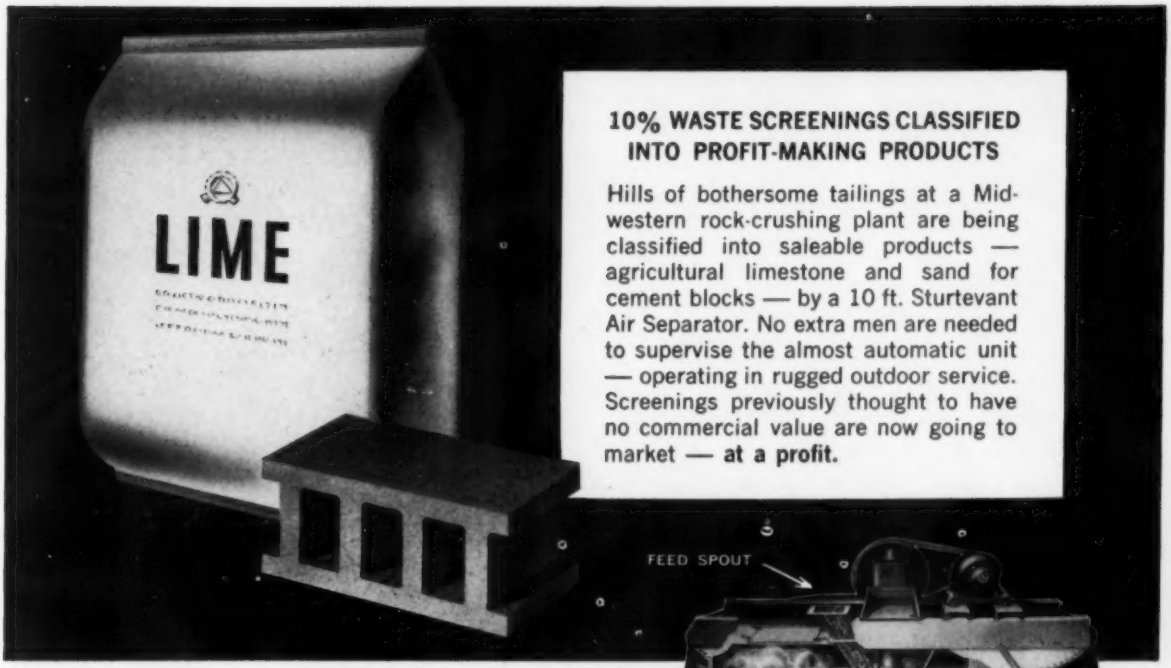
Tailings Go to Market - Separated by Sturtevant



10% WASTE SCREENINGS CLASSIFIED INTO PROFIT-MAKING PRODUCTS

Hills of bothersome tailings at a Midwestern rock-crushing plant are being classified into saleable products — agricultural limestone and sand for cement blocks — by a 10 ft. Sturtevant Air Separator. No extra men are needed to supervise the almost automatic unit — operating in rugged outdoor service. Screenings previously thought to have no commercial value are now going to market — **at a profit.**

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Sturtevant Air Separators range from 3 to 18 ft. in diameter: deliver fines from 40 to 400 mesh at rates as high as 65 tons per hour . . . in the cement industry, have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills.

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Many body types are available in a wide selection of capacities. And, Daybrook Speedlift® Hoists are offered in a range of conventional arm, direct-lift, telescopic, and "Power-Up"—"Power-Down" models. An outstanding feature of conventional arm and direct-lift hoists is the one-year warranty on the sealed hydraulic cylinder.

However rugged the job may be, there's a Daybrook body-hoist "team" to give long, dependable service.

Your Daybrook distributor will be glad to tell you about the many Daybrook exclusive body and hoist features that mean more profitable operation on the "rock routine."

SEND DAYBROOK LITERATURE CHECKED BELOW: 42

ROCK BODIES—HOISTS ☐ POWER LOADER ☐ EXCAVATOR BODIES—HOISTS ☐ POWER GATE ☐

Sign below, attach coupon to letterhead, and mail in envelope.

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DAYBROOK HYDRAULIC DIVISION
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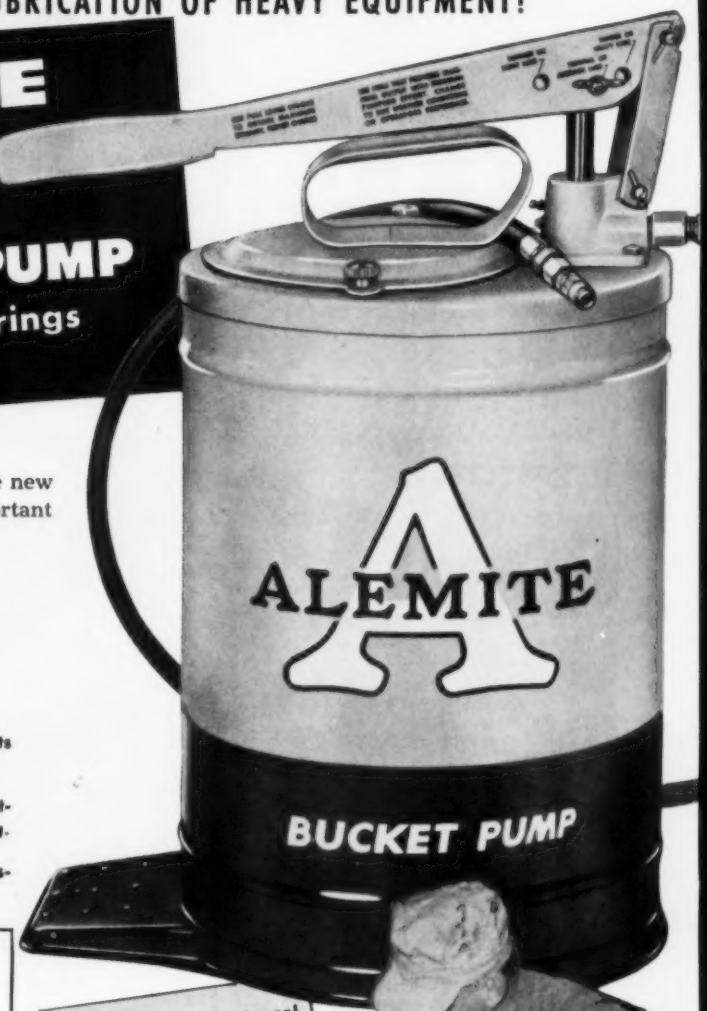
SAVES TIME AND MONEY IN LUBRICATION OF HEAVY EQUIPMENT!

NEW ALEMITE "BIG-A" PORTABLE BUCKET PUMP

Lubricates hundreds of bearings with fewer refillings!



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- **Handles either oil or grease!**
- **Adjustable 3 ways, for —**
  1. Light or heavy lubricants.
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  3. Pressures from 2,500 to 5,000 lbs.

- **Easiest to carry!** Oval shape prevents bucket from bumping leg.
- **Easiest to fill!** Rugged cover is gasket-sealed . . . opens in a jiffy for fast filling.
- **Easiest to service!** One wrench disassembles entire unit.

SPECIAL ALEMITE "BIG-A" FEATURES!

- **Easily handles all lubricants.** Ends air pocket trouble and channeling.
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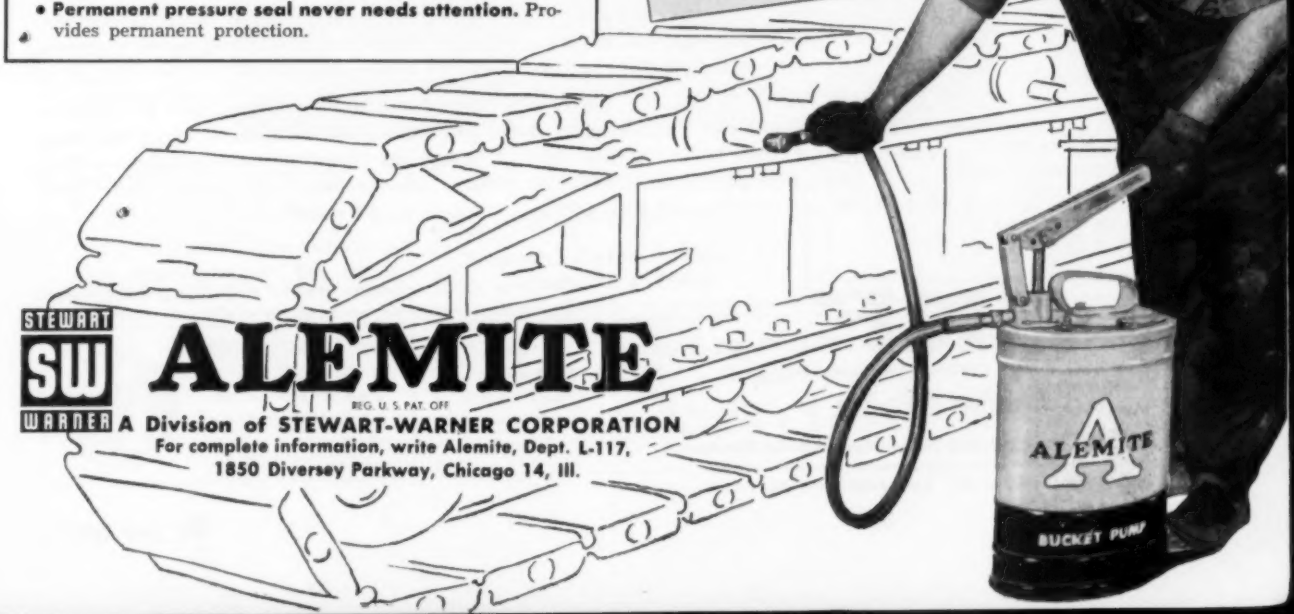
- **Operates at top efficiency,** using any lubricant . . . in any weather.
- **Lube stays refinery clean.** No dirt or moisture entrance, no spilling grease.
- **Permanent pressure seal never needs attention.** Provides permanent protection.

- Exclusive Adjusto Lever!
- 35-lb. Capacity!
- Hard Chrome Piston!
- Non-tilt Foot Rest!
- 7 Models—for all types of lube fittings!



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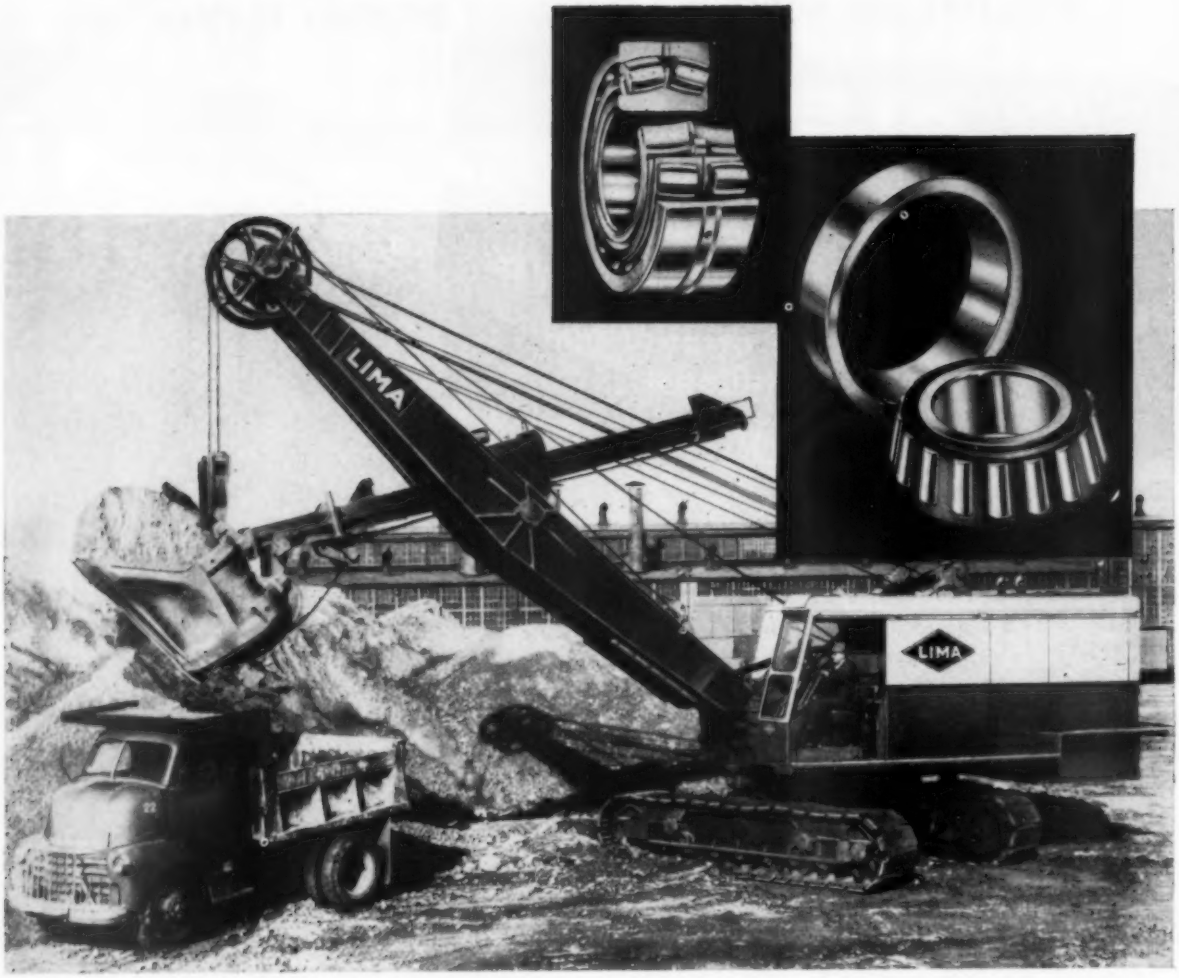

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This rugged, versatile, giant uses SKF Spherical and Tyson Tapered Roller Bearings at all important bearing points to reduce destructive friction and fuel consumption.

Shown is the Lima Type 1250, which is equipped with a 28-foot boom, 22-foot dipper handle and a 3 cu. yd. dipper. The Lima Type 1250-SC can be equipped with a 200-foot boom and a 50-foot jib to handle concrete and steel in building construction up to 24 stories high.

Because Lima needs rugged bearings of proved dependability in carrying top loads under the most difficult conditions – all at low maintenance cost – SKF and Tyson bearings are specified. 7776

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Crushed stone quarry in Chicago area. Write, giving complete details of experience, education and salaries earned. Confidential.

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Must be experienced in crushing and grinding operations. Midwest location. Old, established, progressive manufacturer. Give full details. All replies confidential. Members of our organization know of this ad.

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Rotary Kilns and Dryers,
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Sturtevant 20x14 Balanced Rolls
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One good used 22"x30" or larger Roll Crusher and one good used Duplex Crushing Plant with 10"x24" Jaw Crusher or larger. State year, model, condition and selling price.

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110 HP Clayton port. steam generator
5 yd. Bucyrus 120B electric dragline

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

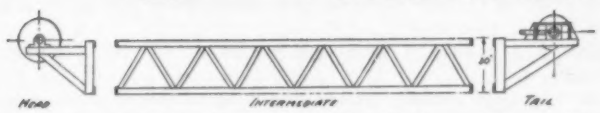
BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

BONDED® 8" Jr. I Beam Frame Conveyor

BONDED® Truss Frame Conveyors



Complete Pre-Fab sections of 8" Jr. I Beam or Truss Frame Conveyors, quickly and easily joined together on the job. Both types of conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2⅞" diam. shaft. Bonded Truss Frame Conveyors are built like a bridge. Designed for long free spans to 50 feet. Constructed of structural angle and reinforced with steel plate. Special high-tensile bolts are used to join all sections. Prices listed are for I Beam Frame Construction. Prices of Truss Frame Conveyors quoted on request. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/16" bottom cover and is fresh stock made by leading manufacturers.

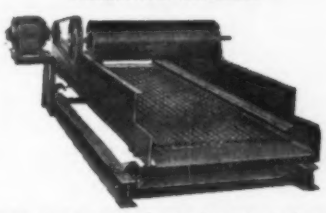
Conveyor Prices Include Belting

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$ 722
14"	85'	3377	1733
16"	20'	1262	636
16"	60'	2662	1359
18"	25'	1477	794
18"	70'	3142	1648
18"	100'	4252	2230
20"	25'	1517	828
20"	75'	3467	1838
24"	25'	1590	898
24"	70'	3480	1875
24"	120'	5580	2950
30"	50'	2911	1617
30"	90'	4831	2614
36"	25'	1818	1118
36"	60'	3638	2096
14"	50'	$2222	$1144
14"	125'	4697	2407
16"	45'	2137	1088
16"	90'	3712	1900
18"	45'	2217	1166
18"	85'	3697	1933
18"	130'	5362	2797
20"	60'	2882	1533
20"	90'	4052	2145
24"	45'	2430	1330
24"	100'	4740	2514
24"	150'	6840	3603
30"	70'	3871	2119
30"	140'	7231	3852
36"	45'	2585	1678
36"	100'	5718	3214

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices acording to belt width. Prices include belting.

For 14" belt, add $16.54 per foot;
For 16" belt, add $19.24 per foot;
For 24" belt, add $21.75 per foot;
For 30" belt, add $27.95 per foot.
For 16" belt, add $18.04 per foot;
For 20" belt, add $20.37 per foot;
For 30" belt, and $24.75 per foot;
Write for Bulletins #1138 and #1189.

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



NEW BONDED® HEAVY DUTY VIBRATING SCREENS

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE AS: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for Bull. #1086.
Priced from $443.00

HEAVY DUTY MODELS, TYPE BS: Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14', 1 to 5 decks. Write for Bull. #1087.
Priced from $1160.00

NEW BONDED® FEEDERS

For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded Troughing Idler Conveyors, thus eliminating the necessity of two motors. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #1182.
Priced from $375.00

NEW BONDED BUCKET ELEVATORS

Open or Enclosed, Vertical or Inclined Bucket Elevators with continuous or spaced buckets mounted on chain or belting. Recommended for small to medium size lumps, fine abrasive material such as dry sand, coke breeze, wet slag and many other bulk materials. Because of the wide variety of sizes and types, prices will be quoted on request. Write for Bull. #1047.

BONDED CONVEYOR ACCESSORIES

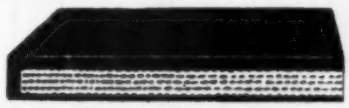
Head & Tail	Wing Pulley	Guide Idler
$149.00	$71.00	$14.50

NEW CONVEYOR BELTING SAVE UP TO 30%

WE PAY FREIGHT

On 200 Pounds Or Over

Heavy duty 4-ply, 28 oz. duck ⅛" top rubber cover by 1/16" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	List Price	Sale Price
14"	4	$3.63 foot	$2.83 foot
16"	4	4.08 foot	2.97 foot
18"	4	4.51 foot	3.29 foot
20"	4	4.97 foot	3.80 foot
24"	4	5.85 foot	4.26 foot
30"	4	7.18 foot	5.21 foot
36"	4	8.51 foot	6.18 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/16" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. This belt is for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

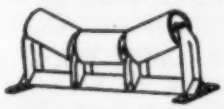
Width	Ply	List Price	Sale Price
14"	4	$4.91 foot	$3.06 foot
16"	4	4.85 foot	3.46 foot
18"	4	5.39 foot	3.83 foot
20"	4	5.90 foot	4.37 foot
24"	4	6.94 foot	4.94 foot
30"	4	8.53 foot	6.07 foot
36"	4	10.09 foot	7.35 foot
24"	5	8.14 foot	5.78 foot

A heavier duty 28 oz. duck belt with ⅛" top rubber cover x 1/16" bottom rubber cover having 3500# to 4000# average cover tensile, 20# to 24# average friction pull, or the higher abrasion resistance applications and handling of materials where more strength is required to give greater belt life.

Width	Ply	List Price	Sale Price
16"	4	$5.48 foot	$3.78 foot
18"	4	6.10 foot	4.20 foot
20"	4	6.68 foot	4.79 foot
24"	4	7.87 foot	5.41 foot
30"	4	9.70 foot	6.65 foot
24"	5	9.11 foot	6.31 foot

Other widths, plies, duck weights and cover thicknesses available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable prelubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from $61.00. Write For Bulletin #1138.

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110 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

QUARRY EQUIPMENT

Cedarapids 2540 jaw only. Rebuilt.
Cedarapids 1836 twin jaw crusher. Good.
Cedarapids 936 jaw crusher.
Cedarapids 3042 double impeller. Rebuilt.
Cedarapids 1024 single pass plant on rubber.
Telsmith 24" cone crusher. Good.
40" x 12' cast steel apron feeder. New.
12"x35' inclined open elevator. New.
2—Cedarapids 4'x12' double deck AG screens.
Cedarapids 4'x12' triple deck screen.
Cedarapids 4'x14 double deck screen. Rebuilt.
New Holland 4'x12' double deck screen. Rebuilt.
Pioneer 4'x8' double deck screen. Rebuilt.
Smithco 24"x87' lattice frame conveyor.
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27½ ton, single-compartment 8'x12' bin.
60-ton, two-compartment, 8'x18' storage bin with clam gates.
100-ton, two compartment, 12'x23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

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Lorain 820 2-yd. diesel shovel-crane.
Lorain 82 2-yd. diesel shovel.
Lorain 79-J 1½ yd. diesel dragline.
Lorain 79 1½ yd. diesel shovel.
P&H 655B 1½ yd. diesel dragline.
2—Bucyrus-Erie 38B, 1½-yard diesel draglines.
Lorain L-50K 1 yd. diesel shovel.
Lorain L-50J 1-yd. diesel clam-crane.
Link Belt LS-85 ⅝-yard diesel shovel-drag.
Lima 34 Paymaster ⅝-yard diesel shovel.
Unit 1020 ¾-yard diesel powered shovel-crane.
Lorain L-28 ¾-yard diesel powered clamshell.
Lorain L-40 ⅝-yard diesel clam-drag shovel.
Lorain TL25S ¾-yd. gas clam-crane.
Unit 414, ½-yard diesel backhoe.
Insley K-12 ½-yd. gas dragline. As is.
Lorain MC-504-W crane clam. Reconditioned.
Lorain MC-414 20-ton Moto-Crane.
Browning T-15-C 17½ ton truck crane.
Link Belt HC-90 25-ton truck crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

2—Euclid 7-yard overhung engine scrapers.
5—Euclid 22-ton rear dumps. Excellent.
1—Mack LRS 15-ton rear dump.
2—Euclid 15-ton rear dumps. Excellent.
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2—Euclid tractors with 3200 gallon water tank semi-trailer.
1—Pullman S-600, 6 to 8 yard scraper.
1—Caterpillar DW-10 scraper.
1—Caterpillar DW-10 with Athey side dump.
1—Allis Chalmers HD-10 tractor with hydraulic bulldozer blade.
1—International 300 tractor, with loader, backhoe.
1—International TD-14A tractor with PCU.
1—International TD18 with Bucyrus-Erie bulldozer blade. Excellent condition.
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1—Caterpillar D-7 with cable bulldozer blade.
1—Caterpillar D-8 with cable bulldozer blade.
1—Austin Western diesel powered grader.
1—Adams diesel powered grader.

SHOVEL ATTACHMENTS

Lorain 820, 2-yd., 23' boom, 21' stick.
Lorain 50, 1-yd., 21' boom, 17' stick.
Lorain 40, ⅝-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 12'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

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Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Koehring 304, 19'10" boom, 5'6" stick, 28" bucket.

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Cat. D7700, 71 H.P. at 1000 RPM. Rebuilt.
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GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

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Barber-Greene 848 Model with drier, gradation unit, etc.

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105 cu. ft. Ingersoll-Rand gas portable.
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⅜ to 1½ yard crawler cranes and 6 Lorain Motocranes acquired from army surplus. We may have what you need.

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Complete Sand Plant—Move it or run it here.
Hetherington Berner Pump 6"
225 HP G.M.C. Diesel Motor and Barge
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Howe Scales—30 tons
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2 yard Dipper 23' boom
Basic Air and shovel air control
Good Condition Now Available

$36,000

Also extra L820 Shovel Attachment complete (no lagging) $4500.

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1 Motor, electric 40/20/27 H.P. Allis Chalmers, three speed, 1740/870/1150 R.P.M. open type, 3 phase, 60 cycle, 440 volt.
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DIAMOND 24x36 Jaw Portable Primary w/apron feeder, vibr. grizzly, conveyor, diesel power, tandem rubber. Secondary Portable w/4020 rolls, 4x12 screen, rotovator, tandem rubber, diesel power. Good. $30,000 Texas.

DIAMOND 65 Portable Gravel Plant w/1036 rb. Jaw, 3018 rolls, plate feeder & hopper, 2 delivery conveyors, 4x10 screen, rotovator, tandem rubber. Bargain. $11,750 New York City. Terms.

CEDARAPIDS Jr. Tandem Portable Plant w/1036 Jaw, 2416 rolls, Cat. diesel, tandem rubber, new 1954, good. $28,500 Texas.

PIONEER Portable Gravel Plant w/1030 rb. Jaw, 3018 rolls, 4x12 screen, rotovator, diesel power, tandem axles, 30" belts, rebuilt. Good. $13,500 Yard. Terms.

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AUSTIN WESTERN 4x40 rb. Jaw Crusher, good. $1500 Yard.

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Gyratory Crushers
Allis Chalmers 8-K, spare parts, extra shaft.

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1—Traylor, 54" x 24", type "AA" (3 motors)
2—Superiors, 16" x 36" (2 motors)
2—Traylors 16" x 30" type A

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Marcy Rod Mill, 3' x 6' with spare parts
Traylor Ball Mill 7' x 6' with 250 HP motor (several tons of balls available)

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All have 20" Rex Roller Bearing Idlers
1—14" x 166' has 35 troughing Idlers
1—14" x 36' has 7 troughing Idlers
4—18" x 20' has 3 troughing Idlers
1—18" x 40' has 11 troughing Idlers
1—20" x 29' has 7 troughing Idlers
1—20" x 36' has 7 troughing Idlers
1—36" x 21' has 6 troughing Idlers

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6 bins, 16' diameter x 14½' height. Cone tops and flat bottoms. Mounted on 10" H-beams with 15' clearance under bins.

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1—16' diameter with 60° slope.

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Two (2) Koehring Dumptors (off the highway) 4½ yds., struck — 6¼ yds., heaped.
16.00x24 and 10.00x20 Tires
GMC 4-71 Diesel Engines — Good condition.
These dumptors are not junkers — GOOD BUYS.
Price F.O.B. Evansville, Ind. $6,500.00 each

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Complete Stone Crushing Plant within 3 miles of proposed new Federal Highway near New Albany, Indiana.
Plant consist of 24 x 36 Pioneer jaw and 36" x 12' apron feeder, a grizzly, all mounted on a steel base by Pioneer, Two 75' Pioneer Conveyors with Torque arm drive, a 3' Standard Simons Cone, 22' Roll, Lima #34 Shovel, IR 315 CFM Rotary Compressor, I.R. Wagon Drill, steel and tools, Two Simons screens, wood bins, steel base, TD 9 and Drott Loader. Complete electric power, Fairbanks Morris 22' scales, scale house, concrete block dynamite house, tool shed. Will sell plant and location or equipment.

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Address inquiries to
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COMPLETE CONCRETE PLANT

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Available immediately. Located in Colorado.

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2—Bartlett & Snow 6' x 30' Rotary Dryers, 7/16" shell.
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1—Ruggles Cole, Class A-8, 5' x 30' Rotary Dryer, ⅜" shell.
3—Louisville 6' x 50' Rotary Steam Tube Dryers.
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1—Abbe Engineering 6' x 15' Silex-lined Tube Mill 75 HP motor.
1—International 6' x 7' Porcelain-lined Pebble Mill 30 HP motor.
1—Dixie #3620 Non-Clog Hammer Mill.
1—Kennedy Van Saun 4'6" x 6' Airswept Tube Mill.
1—Williams Slugger Hammer Mill 30 HP. motor.
1—Allis Chalmers 24" x 12" Jaw Crusher.
3—Jeffrey 20" x 12", 15" x 8" Hammer Mills.

SEPARATORS - SCREENS CONVEYORS - BINS

1—Raymond 16' dia. Single Whizzer Air Separator 50 HP motor.
1—Tyler Hummer 3' x 5' Vibrating Screen.
5—Link Belt, Allis Chalmers 3' x 8' Screens.
7—Rotex, Robinson Gyratory Sifters 40" x 84", 60" x 84", 30" x 104".
9—Belt Bucket Elevators 30' to 60' centers, 8" x 5", 11" x 6" buckets.
950 feet 9", 10", 12", 14" Screw Conveyor with drives.
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1—Steel Rectangular Bin 20' x 20' x 30' high, cone bottom.
2—Steel Cylindrical Bins, 12'6" dia. x 47' high with 9'6" steel skirt.
1—Steel Cylindrical Bin 11'6" dia. x 28' high with Bucket Elevator, and Weigh Scale.

COMPRESSORS

3—Fuller Rotary, Type C-70, 340 CFM, 25 HP motors.
1—Ingersoll Rand PRE2, 1600 CFM, 100 PSI, 300 HP motor.
1—Worthington, Type LTC-6, 800 HP Gas Compressor.
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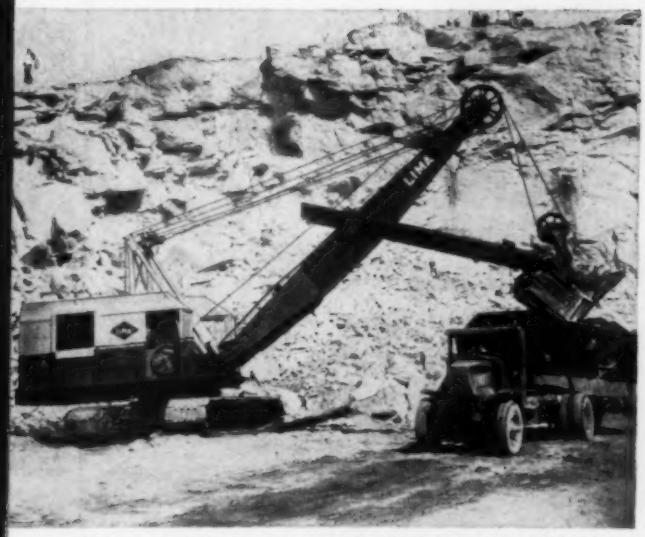
LIMA

LIMAS give you rock-digging power matched to your job requirements

Lima Type 34 Paymaster Shovel, equipped with an 18-ft. boom, 15-ft. dipper handle, and ¾-cu. yd. dipper, excavating in a quarry near Leitchfield, Ky.



Lima Type 1201 Shovel, equipped with 32½-ft. boom, 22-ft. dipper handle, and a 3½-cu. yd. dipper, excavating rock in a quarry near Beverly, S. C.

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WIRE ROPE AT WORK

Here is a drum of wire rope that obviously means business. It's a husky 1½-in. Bethlehem line, and there's approximately 6,000 ft of it. Everything about the installation points to heavy-duty service. Everything also suggests careful maintenance and good housekeeping.

The rope is one of several that Bethlehem has furnished Kaiser Steel Corp. for slope haulage work in its No. 1 and No. 2 Sunnyside Mines, Sunnyside, Utah. It's a Purple Strand rope, Bethlehem's top grade, and it never asks how tough the loads will be. A dependable workhorse, it is being counted on to handle tremendous tonnages during its lifetime at Sunnyside.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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Problem: Bang! And tons of sharp rock will thunder from that freight car, crash down into a metal chute. OK for the rock, but hard on steel. With 7,000 tons needed every day to build a powerhouse, there's no time to wait while steel chutes are repaired.

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Savings: This B.F.Goodrich rubber lining had stood up under a daily avalanche of rocks for four months when the picture was taken, is expected to last another year. No repairs, no delays of any kind.

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Where to buy: Your B.F.Goodrich distributor has the exact specifications of the Armorite described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-213, Akron 18, Ohio.*

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In this photograph taken at a leading portland cement plant in Tennessee, you can see the Cleveland Size 500RT unit. It transmits power that moves the triple agitator back and forth in the big slurry tank.

Never a failure in 28 years of continuous service

FOR 28 years a Cleveland Worm Gear Speed Reducer has operated this triple traveling agitator. Unsheltered from the weather, it has been in service continuously, with never a replacement part or a repair.

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Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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Worm Gear
Speed Reducers

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For Multiwall Bag Buyers

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2. Is your bag properly constructed for your product?
3. If loss of product is caused by deterioration, would special protective sheets help to reduce such loss?
4. Is the total cost of your bag out of proportion to the selling price of your product?
5. Does your product cost warrant redesigning your bag to merchandise your product more effectively?
6. Are you using the most economical filling machine available for packaging?
7. Are your current suppliers giving you the service you desire?
8. Are your suppliers integrated and capable of maintaining dependable service at all times, under all conditions?
9. Are your suppliers' representatives qualified to help you with your packaging, sales promotion and marketing?

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

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